JOIDES Executive Committee

27-28 June 2000, College Station TX, U.S.A.

Agenda Book

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JOIDES EXECUTIVE COMMITTEE MEETING

TEXAS A&M UNIVERSITY
COLLEGE STATION, TEXAS, USA

27-28 JUNE 2000

Executive Committee - EXCOM

Helmut Beiersdorf (Chair)	Bundesanstalt für Geowissenschaften und Rohstoffe, Germany
Maria C. Comas	Instituto Andaluz de Ciencias de la Tierra, Universidad de Granada, Spain, (ECOD)
G. Brent Dalrymple	College of Oceanic & Atmospheric Sciences, Oregon State University, USA
Robert Detrick	Woods Hole Oceanographic Institution, USA
David Falvey	British Geological Survey, United Kingdom
Chris Harrison	Rosenstiel School of Marine & Atmospheric Science, University of Miami, USA
Richard Hiscott (PacRim)	Earth Sciences Department, Memorial University of Newfoundland, Canada
Dennis Kent	Department of Geological Sciences, Rutgers University, USA
Roger Larson	Graduate School of Oceanography, University of Rhode Island, USA
John Mutter	Lamont-Doherty Earth Observatory, Columbia University, USA
John Orcutt	Scripps Institution of Oceanography, University of California, San Diego, USA
David Prior	College of Geosciences, Texas A&M University, USA
C. Barry Raleigh	School of Ocean and Earth Science and Technology, University of Hawaii, USA
Paul Stoffa	Institute for Geophysics, University of Texas at Austin, USA
Hidekazu Tokuyama*	Ocean Research Institute, University of Tokyo, Japan

* Alternate for Asahiko Taira

Associate Member Observers

Mathilde Cannat	Laboratoire de Pétrologie, Université Pierre et Marie Curie, Paris, France
Wang Zhixiong	Marine High Technology Bureau, Beijing, China

Liaisons

John Farrell	Joint Oceanographic Institutions (JOI), Inc., USA
Jeff Fox	Ocean Drilling Program (ODP), Texas A&M University, USA
David Goldberg	Lamont-Doherty Earth Observatory (LDEO), Columbia University, USA
William Hay	GEOMAR Research Center, University of Kiel, Germany
Bruce Malfait	National Science Foundation (NSF), USA

Guests

Jack Baldauf	Ocean Drilling Program (ODP), Texas A&M University, USA
Keir Becker	Rosenstiel School of Marine & Atmospheric Science, University of Miami, USA
Elizabeth Boston	Natural Sciences and Engineering Research Council, Canada
J. Paul Dauphin	National Science Foundation (NSF), USA
Sören Dürr	Deutsche Forschungsgemeinschaft (DFG), Germany
John Fogarty	Joint Oceanographic Institutions (JOI), Inc., USA
James Gill	Department of Earth Sciences, University of California, Santa Cruz, USA
J. Frederick Grassle	Department of Geological Sciences, Rutgers University, USA
Ted Moore	Department of Geological Sciences, University of Michigan, USA
Arthur Nowell	School of Oceanography, University of Washington, USA
Neil Opdyke	Department of Geological Sciences, University of Florida, USA
Michael Purdy	National Science Foundation (NSF), USA
Frank Rack	Joint Oceanographic Institutions (JOI), Inc., USA
David Rea	Department of Geological Sciences, University of Michigan, USA
Robin Riddihough	Natural Resources Canada
Michael Tricker	Natural Environmental Research Council (NERC), United Kingdom
Philippe Vidal	Centre National de la Recherche Scientifique (CNRS), Paris, France
James Watkins	Joint Oceanographic Institutions (JOI), Inc., USA

JOIDES Office

Jeffrey Schuffert	GEOMAR Research Center, University of Kiel, Germany

JOIDES EXECUTIVE COMMITTEE MEETING

TEXAS A&M UNIVERSITY
COLLEGE STATION, TEXAS, USA

27-28 JUNE 2000

MEETING AGENDA

TUESDAY 27 JUNE 9:00 AM

1. Welcome and Introduction		
1.1 Introduction of participants	(Beiersdorf)	
1.2 Meeting logistics	(Prior)	
2. Approval of Agenda	(Beiersdorf)	
3. Minutes and Matters Arising		**TAB 1**
3.1 Approve Feb. 2000 Joint EXCOM/SCICOM Minutes	(Beiersdorf)	
3.2 Approve Feb. 2000 EXCOM Minutes	(Beiersdorf)	
4. NSF/ODP Council Reports		**TAB 2**
4.1 NSF management	(Malfait)	
4.2 ODP Council	(Purdy)	
5. Country and Consortium Reports		**TAB 3**
5.1 ECOD	(Comas)	
5.2 France	(Cannat)	
5.3 Germany	(Beiersdorf)	
5.4 Japan	(Tokuyama)	
5.5 Pacific Rim Consortium	(Hiscott)	
5.6 The Peoples Republic of China	(Wang)	
5.7 United Kingdom	(Falvey)	
5.8 U.S.A	(Malfait/Farrell)	

Coffee Break 10:00-10:30 AM

6. Management and Operations Reports		**TAB 4**
6.1 JOI		
6.1.1 JOI restructuring	(Watkins/Raleigh)	
6.1.2 Search for new JOI President/Ex. Dir.	(Watkins/Raleigh)	
6.1.3 ODP-IODP transition plan	(Orcutt)	
6.1.4 The JOIDES Office 2001-2002	(Farrell)	
6.1.5 Public affairs update	(Farrell/Fogarty)	
6.1.6 IWG Support Office status report	(Farrell)	
6.1.7 PEC-V Report	(Farrell)	
6.2 ODP Operations	(Fox)	
6.3 LDEO Borehole Research Group	(Goldberg)	

Lunch 12:00-1:30 PM

7. Relationships with Other Organizations		**TAB 5**
7.1 International Continental Drilling Program (ICDP)	(Hay)	
7.2 Industry	(Hay)	

8. IODP Planning **TAB 6**

8.1 Status of OD21	(Tokuyama)	

Coffee Break **3:00-3:30 PM**

8.2 IPSC activities	(Moore)	
8.3 U.S. NSF plans	(Malfait)	
8.4 European initiative	(Falvey)	
8.5 IWG	(Purdy)	

WEDNESDAY 28 JUNE 9:00 AM

9. SCICOM Report **TAB 7**

9.1 Achievements on Legs 187-189	(Hay)	
9.2 Ship track for *JOIDES Resolution* through Sept. 2003	(Hay)	
9.3 Proposal activity	(Hay)	

Coffee Break **10:00-10:30 AM**

10. FY 2001 Science Plan and Budget **TAB 8**

10.1 FY 2001 Science Plan	(Hay)	
10.2 FY 2001 budget	(Farrell)	

11. Review of Membership Status	(Beiersdorf)	**TAB 9**
11.1 ECOD	(Comas)	
11.2 Pacific Rim Consortium	(Hiscott)	

12. Future Meetings and Other Business **TAB 10**

12.1 29-30 January 2001, Nikko City, Japan	(Tokuyama)	
12.2 25-26 June 2001, Oxford, UK	(Falvey)	
12.3 Other business		

Meeting Adjourns **1:00 PM**

Scientific Ocean Drilling Links

CDC Conceptual Design Committee
http://www.joi-odp.org/USSSP/cdc/default.html
COMPLEX Conference on Multiple Platform Exploration, May 26-29,1999, Vancouver
http://www.oceandrilling.org/COMPLEX/Default.html
CONCORD Conference on Cooperative Ocean Rise Drilling, July 22-24, 1997, Tokyo
http://mstip1.jamstec.go.jp/jamstec/OD21/CONCORD/result.html
COMPOST I US Committee for Post-2003 Scientific Ocean Drilling, Oct.14-15, 1993, Seattle
http://www.joi-odp.org/USSSP/Pubs/COMPOST/COMPOST.html
COMPOST II US Committee for Post-2003 Scientific Ocean Drilling, Feb. 16-17,1997, Miami
http://www.joi-odp.org/USSSP/Pubs/COMPOST2/COMPOST2.html
IODP Integrated Ocean Drilling Program
http://www.iodp.org/
IPSC IODP Planning Subcommittee
http://www.iodp.org/ipsc/default.html
IWGSO International Working Group Support Office
http://www.iodp.org/iwgso/iwg_sup.html
JAMSTEC Japan Marine Science and Technology Center
http://www.jamstec.go.jp/
JOI Joint Oceanographic Institutions, Inc. (ODP Program Manager)
http://www.joi-odp.org/
JOI/USSSP United States Science Support Program (lists all USSAC information)
http://www.joi-odp.org/USSSP/Default.html
JOIDES Joint Oceanographic Institutions for Deep Earth Sampling (lists all JOIDES panels)
http://www.joides.geomar.de/
JR *JOIDES Resolution*
http://www-odp.tamu.edu/resolutn.html
LDEO/BRG Lamont-Doherty Earth Observatory, Borehole Res. Group (ODP Logging Services)
http://www.ldeo.columbia.edu/BRG/ODP/
LRP Long-Range Plan
http://www.oceandrilling.org/Documents/LRP/LRP.html
NSF National Science Foundation, ODP (US)
http://www.geo.nsf.gov/oce/programs/drilling.htm
OD21 Ocean Drilling in the 21st Century
http://www.jamstec.go.jp/jamstec/OD21/
ODP Ocean Drilling Program (lists all member countries)
http://www.oceandrilling.org/
SEDCO Transocean SEDCO Forex
http://www.deepwater.com/
SSDB ODP SiteSurvey Data Bank
http://www.ldeo.columbia.edu/databank/
STA Science and Technology Agency (Japan)
http://www.sta.go.jp/index-e.html
TAMU Texas A&M University (ODP Science Operator)
http://www-odp.tamu.edu/

Glossary

ADCB	Advanced Diamond Core Barrel
ADN	Azimuthal Density Neutron (Logging tool)
AHC	Active Heave Compensation System
ANTOSTRAT	Antarctic Offshore Acoustic Stratigraphy Initiative
APC	Advanced Piston Corer
ASK	Automatic Station Keeping System
CDC	Conceptual Design Committee
CDR	Compensated Dual Resistivity Tool
COMPLEX	Conference On Multiple-PLatform Exploration
CSES	Conical Side Entry Sub
DAS	Drill String Acceleration Tool
DCB	Diamond Core Barrel
DHML	Downhole Measurements Laboratory
DOSECC	Drilling, Observation and Sampling of the Earth's Continental Crust, Inc.
DPG	Detailed Planning Group
FMS	Formation Micro Scanner
FUSION	Rig Instrumentation System
HRRS	Hard Rock Reentry System
HYACE	Hydrate Autoclave Coring Equipment
ILWG	Industry Liaison Working Group
ICDP	International Continental Drilling Program
ICOSOD	International Conference on Scientific Ocean Drilling
IODP	Integrated Ocean Drilling Program
ION	International Ocean Network
IPSC	IODP Planning Subcommittee
ISP	Initial Science Plan
IWG	International Working Group for Integrated Ocean Drilling
IWGSO	IWG Support Office
LexEn	Life in Extreme Environments
LUBR	Leicester University Borehole Research Group
LWD	Logging-While-Drilling (Logging tool)
MAST	Marine Science and Technology Program (EU Science Support Program)
MDCB	Motor Driven Core Barrel
NAD	Nansen Arctic Drilling Program
PCS	Pressure Core Sampler
PEC V	Fifth Performance Evaluation Committee
PPG	Program Planning Group
RAB	Resistivity-at-the-Bit (Logging tool)
RCB	Rotary Core Barrel
SPWG	Science Planning Working Group
TAWG	Technology Advice Working Group
USSOD	US Conference on Scientific Ocean Drilling
USSAC	US Science Support and Advisory Committee Program
USSSP	US Science Support Program
VIT	Vibration Isolated Television Frame
XCB	Extended Core Barrel

JOIDES EXECUTIVE AND SCIENCE COMMITTEES JOINT MEETING

THE WASHINGTON MONARCH HOTEL
WASHINGTON, D.C.

15 FEBRUARY 2000

Executive Committee - EXCOM

Helmut Beiersdorf (Chair)	Bundesanstalt für Geowissenschaften und Rohstoffe, Germany
James Briden	Environmental Change Unit, Oxford University, United Kingdom
Maria C. Comas	Instituto Andaluz de Ciencias de la Tierra, Universidad de Granada, Spain, (ECOD)
G. Brent Dalrymple	College of Oceanic & Atmospheric Sciences, Oregon State University, USA
Robert Detrick	Woods Hole Oceanographic Institution, USA
Chris Harrison	Rosenstiel School of Marine & Atmospheric Science, University of Miami, USA
Richard Hiscott	Earth Sciences Department, Memorial University of Newfoundland, Canada (PacRim)
Dennis Kent	Department of Geological Sciences, Rutgers University, USA
Roger Larson	Graduate School of Oceanography, University of Rhode Island, USA
John Mutter	Lamont-Doherty Earth Observatory, Columbia University, USA
ohn Orcutt	Scripps Institution of Oceanography, University of California, San Diego, USA
David Prior	College of Geosciences, Texas A&M University, USA
C. Barry Raleigh	School of Ocean and Earth Science and Technology, University of Hawaii, USA
Paul Stoffa	Institute for Geophysics, University of Texas at Austin, USA
Asahiko Taira	Ocean Research Institute, University of Tokyo, Japan

Associate Member Observers - EXCOM

Mathilde Cannat	Laboratoire de Pétrologie, Université Pierre et Marie Curie, Paris, France
Wang Zhixiong	Marine High Technology Bureau, Beijing, China

Science Committee - SCICOM

Sherman Bloomer	Department of Geosciences, Oregon State University, USA
Millard Coffin	Institute for Geophysics, University of Texas at Austin, USA
Steven D'Hondt	Graduate School of Oceanography, University of Rhode Island, USA
Patricia Fryer	Department of Geology and Geophysics, University of Hawaii, USA
William Hay (Chair)	GEOMAR Research Center, University of Kiel, Germany
Nils Holm	Department of Geology and Geochemistry, Stockholm University, Sweden (ECOD)
ock Keene	School of Geosciences, University of Sydney, Australia (PacRim)
mily Klein	Department of Geology, Duke University, USA
Kenneth Miller	Department of Geological Sciences, Rutgers University, USA
Gregory Mountain	Lamont-Doherty Earth Observatory, Columbia University, USA
David Rea	Department of Geological Sciences, University of Michigan, USA
Alastair Robertson	Department of Geology and Geophysics, University of Edinburgh, United Kingdom
Hidekazu Tokuyama*	Ocean Research Institute, University of Tokyo, Japan
Douglas Wiens	Department of Earth and Planetary Science, Washington University, USA
James Zachos**	Department of Earth Sciences, University of California, Santa Cruz, USA

Associate Member Observers - SCICOM

John Ludden	Centre de Recherches Pétrographiques et Géochimiques, CNRS-Nancy, France
Zhou Zuyi***	Department of Marine Geology & Geophysics, Tongji University, Shanghai, China

* Alternate for Yoshiyuki Tatsumi
** Alternate for J. Casey Moore
*** Absent

Liaisons

Jack Baldauf	Ocean Drilling Program (ODP), Texas A&M University, USA
Jeff Fox	Ocean Drilling Program (ODP), Texas A&M University, USA
David Goldberg	Lamont-Doherty Earth Observatory (LDEO), Columbia University, USA
Neil Lundberg	Department of Geology, Florida State University, USA
Bruce Malfait	National Science Foundation (NSF), USA
Kathryn Moran	Joint Oceanographic Institutions, Inc. (JOI), USA
Julie Morris	Department of Earth and Planetary Science, Washington University, USA

Guests

James Allan	National Science Foundation (NSF), USA
James Austin	Institute for Geophysics, University of Texas at Austin, USA
Mahlon Ball	U.S. Geological Survey, Denver, USA
Keir Becker	Rosenstiel School of Marine & Atmospheric Science, University of Miami, USA
J. Paul Dauphin	National Science Foundation (NSF), USA
Margaret Delaney	Department of Ocean Sciences, University of California, Santa Cruz, USA
John Diebold	Lamont-Doherty Earth Observatory, Columbia University, USA
Sören Dürr	Deutsche Forschungsgemeinschaft (DFG), Germany
John Farrell	Joint Oceanographic Institutions, Inc. (JOI), USA
Chris Franklin	Natural Environmental Research Council (NERC), United Kingdom
James Gill	Department of Earth Sciences, University of California, Santa Cruz, USA
J. Frederick Grassle	Department of Geological Sciences, Rutgers University, USA
Roy Hyndman	Geological Survey of Canada, Sidney, B.C., Canada
Tom Janecek	Antarctic Research Facility, Florida State University, USA
Hajimu Kinoshita	Japan Marine Science and Technology Center (JAMSTEC), Japan
Kazuhiro Kitazawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Shin'ichi Kuramoto	Science and Technology Agency (STA), Japan
Ted Moore	Department of Geological Sciences, University of Michigan, USA
Arthur Nowell	School of Oceanography, University of Washington, USA
Robert Owen	Department of Geological Sciences, University of Michigan, USA
Nicklas Pisias	College of Oceanic & Atmospheric Sciences, Oregon State University, USA
Warren Prell	Department of Geological Sciences, Brown University, USA
Michael Purdy	National Science Foundation (NSF), USA
Mary Reagan	Lamont-Doherty Earth Observatory, Columbia University, USA
Masanori Shinano	International Working Group (IWG) Support Office, USA
Thomas Shipley	Institute for Geophysics, University of Texas, USA
Shiri Srivastava	Geological Survey of Canada Atlantic, Bedford Institute of Oceanography, Canada
Neil Sullivan	Department of Physics, University of Florida, USA
Kiyushi Suyehiro	Japan Marine Science and Technology Center (JAMSTEC), Japan
Shinichi Takagawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Takeo Tanaka	Japan Marine Science and Technology Center (JAMSTEC), Japan
Philippe Vidal	Centre National de la Recherche Scientifique (CNRS), Paris, France
James Watkins	Joint Oceanographic Institutions, Inc. (JOI), USA
Robert Winokur	Consortium for Oceanographic Research and Education (CORE), USA

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Warner Brückmann	GEOMAR Research Center, University of Kiel, Germany
Bettina Rohr	GEOMAR Research Center, University of Kiel, Germany
Jeffrey Schuffert	GEOMAR Research Center, University of Kiel, Germany

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15 FEBRUARY 2000

DRAFT MINUTES

A. Welcome, Introductions, and Logistics

Helmut Beiersdorf welcomed everyone to the joint portion of the EXCOM and SCICOM meetings and asked the participants to introduce themselves when speaking. Beiersdorf hoped that this special joint meeting would foster communication among all parts of ODP and help to dispel the perception that EXCOM sat too far removed from the science planning process. He emphasized the importance of these goals, given the difficult task of planning the phase-out of the old program and phase-in of the new one. Beiersdorf looked forward optimistically to a successful meeting and thanked the management at JOI for arranging the meeting facilities and social events.

Kate Moran explained the meeting logistics and introduced Bridget Chisholm and Jenny Ramarui as assistants from JOI. She also noted a few minor changes to the schedule and reminded everyone about a special ODP seminar scheduled for the following evening at the Canadian Embassy.

B. Approval of Agenda of Joint Meeting

Beiersdorf announced several minor changes to the agenda for the joint meeting, and all committee members approved the revised agenda by consensus.

C. Selected ODP Achievements

Warren Prell reported on the preliminary results of Leg 184, the first major drilling expedition in the South China Sea (SCS). He stated the main goal of understanding the Southeast Asia monsoon system and then described the strategy of studying different sedimentary regimes with different sedimentation rates. Prell showed the seasonal pattern of rainfall migration across Southeast Asia and explained that sedimentary records from the SCS should preserve the effects of that seasonal migration and its variability through time. He noted that they drilled at five sites, one in the southern SCS and four in the northern SCS, and logged at four of the five sites. He also noted that to reach the target objectives at three sites, they had to drill deeper than planned because of higher than expected sedimentation rates. Prell said that all of the sites should yield high-resolution records of climate variability on orbital and sub-orbital time scales. In particular, the section recovered at Site 1144 extends to only 1 Ma but has a very high sedimentation rate and thus offers an excellent chance for studying rapid, abrupt climate change. Site 1146 yielded a continuous section extending to 20 Ma with no significant disturbances or turbidites, and Site 1148 penetrated Oligocene (32 Ma) deep-water sediment, thus resolving a debate over the nature and depth of the seismic reflectors at that site.

Hay asked whether sedimentation rates increased in the SCS at 8 Ma, as expected by analogy with the Arabian Sea. Prell said that some of the SCS sites showed an increase in sedimentation rates, but only during last 300 kyr. Miller asked if they had determined the onset of the monsoon system, but Prell said that it would take much more analytical work to answer that question. D'Hondt asked whether the recovered sequences remained rich in sulfate or showed evidence of methanogenesis. Prell said that some methane occurred in the lower parts of the sections. Robertson asked if the results from Leg 184 might shed any light on the tectonic history of the SCS. Prell confirmed that their results definitely could contribute to a better understanding of what happened tectonically at the boundary between continental and oceanic crust.

John Ludden reported on the preliminary results of Leg 185 to the Izu-Mariana forearc. He described the leg as a study of subduction zone fluxes in terms of global geochemical balances and explained the goals of characterizing the geochemistry of the subducting sediment, pore fluid, organic matter, and crust. Ludden said that they returned to Site 801, penetrating the oldest known piece of oceanic crust from a fast-spreading ridge, and drilled a new hole nearby at Site1149. He noted that they found evidence in the basaltic glasses for microbial alteration. Other leg highlights included the first shipboard microbiology tests for contamination and culturing of bacteria and the discovery that a rapid switching of the magnetic signal downhole could explain the apparent magnetic quiet zone as measured from the surface.

Raleigh asked if the sedimentary sections looked fractured as well as the basement. Ludden said that no one looked specifically for fracturing, though one scientist measured shear strength downhole. Comas asked about the recovery at Site 801. Ludden said that they had a recovery rate of 40-50%. Robertson asked if they found any signs of local hydrothermal alteration. Ludden said that they drilled through two active alteration zones, with silica-rich deposits, at temperatures of 50-60°C. Larson described the alteration zones as still very permeable but not active. Morris asked whether the style of alteration differed at these sites compared to other sites such as Hole 504B. Ludden replied that they saw a difference even between the two sites drilled on this leg.

Suyehiro reported on the preliminary results of Leg 186 to the Japan Trench. He described the main objective of installing two geophysical observatories as part of the ION project and mentioned that borehole sensors provide a better signal than seafloor sensors. Suyehiro showed a map of seismic activity around Japan since 1926 and explained that these records played a crucial role in selecting the two drilling sites, with Site 1150 located in a region of high seismic activity and Site 1151 located in an aseismic zone. He characterized the regional subduction zone as tectonically erosive and said that sedimentation rates varied from 20–200 cm kyr^{-1}. Suyehiro described the challenges of drilling through old sediments and cementing instruments in the borehole at 1200 mbsf. He said that the leg ultimately succeeded, although JAMSTEC installed the actual sensors later. Suyehiro showed ROV camera photos of the seafloor package in place, noting the power and data recovery connections on top of the reentry cone. He said that the system can run for several years on battery power, and replacement of the batteries could extend the life of the observatories for many years.

Morris asked if they planned to install a cable for real-time data recovery. Suyehiro confirmed that they planned to extend an existing cable about 10 km to the new sites. Wiens asked when they would retrieve the first data, and Suyehiro said in September 2000. Orcutt asked if they grouted the seismometers in the hole, and Suyehiro said yes. Raleigh asked about the type of transducer used in the instruments. Suyehiro stated that they used a standard linear vertical differential transducer (LVDT). Robertson wondered if any other useful science might result from this leg. Suyehiro replied that other topics of study would include volcanic ash layers, subsidence history, and the much greater decrease in salinity than observed at other active margin sites.

Following the leg reports, Hay offered a summary of recent papers in *Science* and *Nature* related to ODP results. He noted that the authors did not always mention ODP in the title or abstract, but they often used ODP data as reference sections to compare with other new data. Hay said that paleoclimate studies had made an especially strong showing, with emphasis on young sedimentary records, particularly of Holocene age.

Beiersdorf stressed the importance of evaluating the scientific literature for ODP content because of the need to document the achievements of ODP more clearly in the phase-out plan and to address a shortcoming identified by the PEC-V. Allan commented that he had searched the literature last summer, mostly in *Science* and *Nature*, and found over 100 articles related to ODP science. He admitted feeling surprised at how much use the cores had received and the generally good level of acknowledgement to ODP. Watkins recommended that the program should view this as a public

affairs opportunity and do a thorough, systematic job of identifying this information over the next two years. He also suggested approaching the authors and asking them what they would have lost without the ODP data. Beiersdorf hoped to make it a broader, more visible effort. Hay said that SCICOM would definitely devote time to this issue and again emphasized the hidden nature or lack of direct attribution to ODP. Mountain asked if that reflected upon authors from outside of the ODP community or upon those who should know better. Hay replied that the slighting of ODP did not seem intentional. Mountain suggested that the authors of these papers might make good candidates for the distinguished lecture series. Allan saw it as a more serious problem of researchers not properly documenting or acknowledging the source of their samples. Hay said that sometimes he could only trace the link to ODP through the reference list or figure captions. D'Hondt asked whether the papers usually included site numbers. Hay answered yes, but they did not always identify the sites as ODP holes and sometimes even used the pre-drilling site designation. Coffin felt that this simple exercise illustrated the success of the program but also the failure to show that ocean drilling comprises a vital part of the scientific community. He added that even after 30 years of success, we still have to justify the need for more ocean drilling, whereas astronomers, for example, do not have to do this. Raleigh suggested that we have to convince our fellow scientists, not the public or the government.

D. NSF/ODP Council Report

Bruce Malfait diagrammed the NSF programmatic structure and updated the report distributed in the Agenda Book, noting recent personnel changes at NSF, such as the hiring of Margaret Leinen in mid January, and mentioning that some developments had occurred with respect to India joining the program. An audit of JOI indicated that everything essentially balanced out, with unallowable charges amounting to less than $5000 and a few allowable but uncharged items identified. Malfait explained that the U.S. Government Performance Results Act now requires every federal agency to identify its goals for each year and report on how it met those goals. ODP fared well in the sense that it experienced a very low rate of facility downtime, less than 1%, throughout the program. Malfait showed the agenda for the upcoming IWG meeting, noting that Ted Moore would deliver a status report on IPSC and Peggy Delaney would report on progress of the CDC. IWG would also discuss international arrangements for the future program as well as the response concerning the IODP Initial Science Plan.

E. Country/Consortium Reports

Beiersdorf accepted the country and consortium reports as read and invited each national representative to offer additions as necessary. Rick Hiscott introduced himself and Jock Keene as the new PacRim representatives for EXCOM and SCICOM, respectively. Menchu Comas announced that Ireland plans to join ECOD and that ESF would soon submit a Letter of Intent to participate in IODP planning. Asahiko Taira distributed the report from Japan and added that Japan and France would cooperate this year to obtain further 3-D seismic data from eastern Nankai. Jim Briden announced that David Falvey would replace him after this meeting, and Chris Franklin would represent the U.K. at the IWG meeting this week. He also noted that the U.K. would hold an ODP meeting in early March. Mathilde Cannat and Wang Zhixiong had nothing to add to their reports. Beiersdorf introduced Sören Dürr as the replacement for Dietrich Maronde from DFG.

Beiersdorf reported on an ESF sponsored workshop on 27 January 2000 in Strasbourg, France. He said that the workshop participants fully endorsed the IODP Initial Science Plan, and he listed specific topics of interest to European scientists, including the deep biosphere, gas hydrates, Arctic drilling, deep margins, and tectonic processes. Beiersdorf also listed the members of an advisory group for establishing a joint European Ocean Drilling Initiative toward participating in IODP and for advising European funding agencies on ODP/IODP matters. Cannat expressed optimism about this effort. Holm added that the European consortium now had everyone on board to issue a Letter of Intent to join the new program. Taira asked if the European goals on infrastructure included

other platforms. Beiersdorf replied that those goals could include platforms, laboratories, or tools, but they could not yet offer specific details before talking further with funding agencies, political entities, and industry.

F. ODP Management and Operations Report

F.1 FY2001 Budget

Moran illustrated how the FY2001 target budget of $46.1M would distribute among TAMU, LDEO, and JOI and said that the exact numbers could change by about $200K. She showed a map of the FY2001 drilling schedule and explained that Legs 193 (Manus Basin), 196 (Nankai II), and 198 (Hydrate Ridge) would require special operating expenses for LWD. In addition, two advanced CORKS on Leg 196 and microbiology in general would entail added costs.

Moran proposed to switch the schedule for Legs 198 (Hydrate Ridge) and 199 (Equatorial Pacific) because this would effectively defer one relatively expensive leg until the next fiscal year. Detrick asked if such a switch would push Hydrate Ridge into an unfavorable weather window. Moran replied that it looked marginal toward the end of the leg, but Leg 146 had succeeded in the same area during that time of year, plus LWD could wait until the end of the leg and tolerate marginal weather conditions.

F.2 Drydock

Moran identified various shipboard facilities upgraded during drydock, including the data management system, auto station-keeping, the seventh level on the lab stack (primarily for microbiology and downhole tools), the main core lab, H_2S safety equipment, and the Schlumberger data acquisition unit.

F.3 Microbiology

Moran noted several recent achievements with regard to microbiology, including a LExEn grant of $250K for shipboard equipment, definition of shipboard sampling protocols and technical needs by the Biology Under Ground Steering Committee (BUGSCOM), and submission of two microbiology proposals. She said that further plans call for extensive modification of the shipboard microbiology lab on the transit leg in May 2000, with routine staffing of microbiologists beginning on Leg 190 (Nankai Trough). Moran also expressed optimism about moving forward on microbiology collaborations in Europe.

Morris asked about the division of labor between BUGSCOM and the Deep Biosphere PPG. Moran replied that BUGSCOM did its work and has ended. She explained that JOI formed BUGSCOM to implement the recommendations of the Deep Biosphere PPG and SciMP. BUGSCOM provided direct guidance on what equipment to buy and what protocols to follow. Beiersdorf added that the ODP managers had agreed to form this small group to fill a short-term need for quick action before the Deep Biosphere PPG could hold its next meeting.

F.4 ODP Industry Partnerships

Moran reported that good progress had occurred on the HYACE project and the JAMSTEC/JOI agreement for developing the advanced diamond core barrel (ADCB), and work might start soon on retractable bit technology. She described a recent joint academic–industry workshop in Houston as very successful and said that JOI had consequently received seven pre-proposals for review. The proponents planned to prepare those pre-proposals for submission before the 15 March 2000 deadline. Moran commended John Armentrout and Felix Gradstein for their efforts in organizing and leading the workshop and said that a second workshop on geopressures would occur in March 2000. Moran gave a talk to the Canadian Society of Petroleum Geologists in Calgary before a group of more than 800 industry scientists who meet for lunch every two weeks, and JOI had prepared a paper for the Offshore Technology Conference in May 2000. Other scheduled events included a special meeting at AAPG on the Gulf of Mexico and a follow-up workshop in Europe

this summer. Moran also recommended establishing a formal industry liaison committee in ODP and IODP.

F.5 Performance Evaluation Committee (PEC-V)

Moran reported that JOI had received the PEC-V report and obtained comments on it from the ODP subcontractors. She planned to present those comments to the JOI BoG this week and seek their approval to submit the overall report to NSF. She then expected to distribute the report to others in JOIDES for comment. Moran said that PEC-V concluded that program management and operations had improved significantly since the previous evaluation. She explained that although the report contains minor detailed recommendations on management, the major concern of PEC-V centers on the prospect of a drilling gap between ODP and IODP.

Beiersdorf said that EXCOM should see the PEC-V report as soon as possible because it might contain suggestions about JOIDES management with respect to planning and policy making. He conceded that EXCOM had to accept the decision not to distribute the full report yet. Moran said that the JOIDES Office had received a copy and could certainly distribute any part of it. Briden questioned the unprecedented route of implementing the report without obtaining advice from the JOIDES advisory structure. He understood the formal reporting requirements, but noted that all previous PEC reports had gone to EXCOM and SCICOM, and he wondered if the JOI BoG felt content that it could do an optimum job without going through that loop. Raleigh did not think they intended to miss that step. Although he had not seen this report, he noted that previous PEC reports typically dealt with subcontractor issues, and JOI had to assemble the comments of the subcontractors to complete the overall report to NSF. Raleigh promised that EXCOM would receive the report before the JOI BoG acts upon it. Pisias reiterated that the JOIDES Office received the report, so the advisory structure should have it. Hay confirmed that the JOIDES Office had received the report and responded to specific questions posed to it by JOI, but had not seen anything further.

Briden said that as he understood it, the report would go to the JOI BoG, they would report to NSF and that would represent the final step. Moran explained that the full report to NSF would include the PEC-V report and the comments from the subcontractors, including the JOIDES Office, but JOI needed approval from the JOI BoG before they could officially send anything on contracts to NSF. Moran believed that the process had proceeded appropriately. Beiersdorf said that EXCOM would have to review the report carefully and make suggestions at the next meeting on how to respond to immediate issues identified by PEC-V concerning the JOIDES advisory structure. Briden asked if that meant that no action would occur until after July. Raleigh replied that action could occur as soon as the BoG had given their approval. Moran said that they could do so at the meeting this week. Raleigh said that the JOI BoG had no problem with the procedure, and he did not know why it appeared that one existed. Beiersdorf read a portion of the executive summary from the PEC-V report that criticized the lack of a document summarizing the overall achievements of the program. He said that EXCOM must prepare to address this serious issue at its next meeting after receiving copies of the full report.

F.6 Public Affairs

Moran commented on the success of recent public affairs activities, including the June 1999 port call in Yokohama, Japan, the ODP booth at the December 1999 AGU meeting in San Francisco, and the series of four ODP Seminars on Capitol Hill that would conclude this week. She also mentioned several upcoming activities such as the ODP booth and special symposium at the February 2000 AAAS meeting, the March 2000 port call in Hobart, Tasmania, and the May 2000 American Society of Microbiologists meeting.

F.7 Communications
Moran reported that a meeting of representatives from the international program offices in September 1999 at JOI had successfully improved communication and understanding on a program-wide basis. She hoped to schedule a similar meeting in early 2002. Over 300 scientists attended the ODP town meeting at the December 1999 AGU meeting, and the managers of the ODP contractors continue to meet on a regular basis.

G. SCICOM Report, Amendment of Terms of Reference
Hay reported on the final membership of the new PPGs for Hydrogeology and the Arctic's Role in Global Change. He noted that the program effectively had industry money coming in to support Martin Hovland as chair of the Arctic group. Watkins expressed concern about integrating the new USCG cutter Healy into the plans for Arctic drilling. Hay believed that some of the U.S. members on the PPG had the knowledge to address that issue.

Hay presented the following request from SCICOM to amend the Terms of Reference regarding the establishment of liaisons to PPGs.

SCICOM Motion 99-2-16
SCICOM requests EXCOM to amend the Terms of Reference for Program Planning Groups as follows:

6.5 **Liaison.** ~~SCICOM establishes liaison with the PPGs by the appointment of non-voting liaisons~~. The SSEPs will appoint liaisons to the PPGs, and ~~The~~ PPG Chairs ~~will~~ may attend one meeting of the SSEPs per year, ~~as~~ if requested by the SSEPs Chairs.

Mountain asked about the reason for not requiring the PPG chairs to attend a SSEPs meeting once per year. Hay said that the proposed change allows the SSEPs chairs the flexibility to decide when and how often the PPG chairs would attend. Mountain wondered why SCICOM constitutes the PPGs and then lets the SSEPs decide how to incorporate their input into the program. Lundberg explained that the question of how the panel structure should handle the PPGs has a long history, especially concerning the conflict of interest issue, and although SCICOM establishes the PPGs, they decided that the PPGs should report to the SSEPs. He said that the SSEPs hope to communicate more closely with the PPGs and had invited the two new PPG chairs to the next SSEPs meeting, but they do not necessarily want to receive the final PPG reports. Hay added that the PPG chairs now consult regularly with the SSEPs. Beiersdorf deferred voting on this issue until the separate EXCOM session.

H. Partnerships with ODP

H.1 International Continental Drilling Program (ICDP)
Hay reported on the progress of cooperative efforts between ODP and ICDP. He announced that a JOIDES observer would attend the next ICDP meeting for proposal discussion and ranking, and an ICDP observer would attend the next SSEPs and SCICOM meetings. In addition, TEDCOM would meet with the ICDP drilling technology group in Potsdam, Germany. Hay also raised the question of how to pay for liaisons to non-JOIDES meetings.

Larson asked about the membership and budget of ICDP. Miller explained that ICDP has three full members, the U.S., Germany, and Japan, and several associate members, including China, Mexico, and Poland. He also clarified that the $2M annual ICDP budget acts only as leverage; the actual drilling projects have a much higher total budget. Mutter suggested identifying and pursuing the result desired several years from now in terms of a joint commitment, but Hay saw the first step as just getting to know each other. Larson recalled that several years ago the continental drilling side had taken a very open and encouraging view toward merging with ODP. He thought it seemed reasonable from a conceptual standpoint, if not a political one. Beiersdorf stressed the importance

of increasing the manpower in ODP to run more platforms and said that he viewed ICDP as the best place to start because of the strong overlap in interests.

Fox noted that TAMU had already received support from NSF and DOSECC for a half-time engineer to design and build a portable lake-drilling platform for ICDP projects. Orcutt mentioned EarthScope and the San Andreas Fault Observatory at Depth (SAFOD) project, but Miller commented that EarthScope did not represent an ICDP or DOSECC activity. Orcutt replied that it nonetheless represented continental drilling and it would most likely receive funding. Fryer noted that COMPLEX had identified high-latitude drilling as an important goal and wondered if EXCOM or SCICOM had considered land-based drilling in Antarctica or the Arctic. Beiersdorf thought that the Arctic PPG could consider the issue and redirected the discussion toward strengthening the connection between ODP and ICDP. He hoped to clarify the liaison and funding issues tomorrow. Miller suggested coordinating along the lines of publications and archiving, two areas where ODP performs well but other groups lack capability. Beiersdorf agreed that the ability to archive non-ODP material represented a good topic of future discussion among EXCOM, SCICOM, and IPSC.

H.2 Industry

Beiersdorf reported on a forum held last November at BGR in Hannover to familiarize German industry with ODP activities. Twenty engineers, managers, and scientists from industry attended the forum, and fifteen ODP scientists gave talks on a variety of themes. The industry representatives requested more meetings of this sort and offered to assist in proposal preparation. Beiersdorf foresaw increased industry participation at the annual German ODP meeting and an expanded basis for recruiting industry experts to staff ODP/IODP advisory panels, though the instability within industry would remain a problem. Briden commented that last year's European industry forum resulted in an increased level of engagement focusing on margins and slopes and a greater awareness of ODP among service and technology components of industry. Beiersdorf noted that industry also participated at the recent Strasbourg workshop, and the European Ocean Drilling Initiative had since begun drafting a proposal aimed toward improving links among various industries and entities for achieving full European membership in IODP. Ludden clarified that they hoped to establish a rotating position for a liaison between national secretariats and industry. Beiersdorf added that the workshop participants stand fully behind this approach and hope to succeed in obtaining funding from Brussels for common proposals or for better databases and technologies.

H.3 Other Scientific Initiatives

Beiersdorf noted that EXCOM at its last meeting had named a subcommittee (Taylor, Mutter, Orcutt, Beiersdorf) for promoting cooperation with other scientific initiatives around the world. He said that although the subcommittee had nothing substantial to report yet, they planned to contact other initiatives such as InterRidge, InterMargins, and ION before the next meeting. Beiersdorf suggested that all EXCOM members could look into these types of initiatives and alert the subcommittee. He viewed this as a first attempt to find common ground for encompassing a larger community, and he said that EXCOM would revisit the issue at all subsequent meetings and discuss how to improve their efforts.

H.4 Distance Learning Initiative

Jack Baldauf reported that the Colleges of Geoscience and Education at TAMU had formed a partnership to establish a Distance Learning Initiative within ODP. TAMU had already received a $350K grant for this project from the State of Texas, and they planned to seek additional external support from corporate sponsors. As an immediate goal, TAMU hoped to sail a high school science teacher on Leg 194. The teacher would broadcast lessons by INMARSAT to students in the classroom, initially targeting rural middle schools (grades 6-8) in Texas. This initiative would deliver shipboard and classroom equipment, a web-based curriculum, instructional material, real-

time communication between the ship and classroom, and a professional development workshop at TAMU for teachers. Other benefits would include an enhanced link between ODP and the K-12 education community, direct teacher involvement, and delivery of today's science into the classroom. The Distance Learning Initiative would greatly increase the educational capability of the *JOIDES Resolution*, and it would lay the foundation for a broad-based educational outreach program. TAMU therefore sought endorsement from EXCOM for sailing secondary school teachers and for the time resources required of ODP/TAMU staff to complete the project.

Cannat asked whether the international community would have access to the web-based curriculum, Klein asked about its availability in other languages besides English, and Fryer asked if TAMU hoped that NSF would support the international effort. Baldauf replied that the international community would have full access to the web-based material and that TAMU hoped to obtain international support for the long-range goals of an expanded outreach program, available in multiple languages. Fryer also asked how this project would affect the berthing of scientists, but Baldauf could not say because TAMU had not yet completed the staffing of Leg 194. Fox mentioned that ODL often had extra berths and perhaps ODP could use one for a teacher. Mutter asked to what extent the teachers would participate in the science onboard. Baldauf said that he would prefer to have them involved, perhaps by training them for one of the simpler jobs, but selecting the right individuals would pose the greatest challenge. Fryer asked how far the plan had progressed, and Bauldauf repeated that TAMU had already received funding and proceeded now with planning how to implement the program. Klein mentioned that some textbooks have a feature box about ODP and urged TAMU to contact publishing companies about publicizing the web links.

Bauldauf showed a USSAC Consensus Statement encouraging SCICOM to sail high school teachers on the *JOIDES Resolution*. Delaney added that USSAC approved the statement after hearing a report from TAMU about the distance learning initiative. Prior explained that the TAMU initiative arose from a concern about the quality of science education in the State of Texas. He emphasized that it would build upon previous efforts in the science and education colleges and provide a springboard for a broader outreach program in the future. Beiersdorf applauded TAMU for their initiative toward the important issue of enhancing science understanding across the globe. He suggested that SCICOM should decide whether the distance learning initiative would have a net positive or negative effect on ODP, balancing the primary concerns about berth space and support for TAMU staff to finish the planning effort against the benefit of expanded educational outreach. Beiersdorf requested SCICOM to craft a motion the following morning and send it back to EXCOM in the afternoon because TAMU could not wait until the next meeting for an answer.

I. IODP Planning

I.1 OD21 Report

Asahiko Taira began by showing a silhouette of the *JOIDES Resolution* superimposed on a silhouette of the much larger OD21 riser drilling ship. Shin'ichi Kuramoto continued with an update on the status of the OD21 science, budget, organization, and basic design and construction of the ship. He showed a timeline of various OD21 activities and stated that STA had already received authorization for 74% of the total $500M budget. Shinichi Takagawa reported that JAMSTEC would complete the design of the riser drilling ship by the end of February 2000 and that construction would begin in March 2000. He showed schematic drawings of the ship and its facilities for core processing, other lab space, and research management. Takagawa explained that the ship would accommodate 150 personnel, mostly with single-room berths (128 single, 11 twin), and the typical single room would occupy 10 m^2 of floor space.

Hiscott asked about the proportion of scientists versus crew. Takagawa said that the basic design allotted for 31 scientists, 21 technicians, and the rest crew, with eight reserves. Harrison noted that the *JOIDES Resolution* accommodates about the same number of scientists and technicians and

wondered whether some operations of the riser drilling ship might require a larger science party. Takagawa said that JAMSTEC expected a turnover of the science party during a leg because riser legs would last at least six months rather than two. Taira added that re-supply operations would provide a chance for turnover of scientific personnel. Larson asked if JAMSTEC had chosen a construction contractor, and Takagawa answered no, not yet.

I.2 Conceptual Design Committee (CDC) Progress Report

Peggy Delaney reported on the charge, strategy, and progress of the CDC. NSF and USSAC established the CDC to formulate a conceptual design for a non-riser vessel. The CDC would identify the optimal capabilities needed for scientific drilling, provide a feasibility survey of existing and planned vessels, and prepare a detailed report by 1 March 2000. Delaney listed the CDC membership, noting that it included a private technical consultant and a liaison from IPSC. The CDC met in June and September 1999 and adopted a strategy for synthesizing high-priority science into type sections and defining the technical requirements for drilling those type sections. They also canvassed existing international ship owners, matched the technical requirements with known ship capabilities, and recommended ships with possible capital modification to NSF.

The CDC requested target sections from the U.S. chairs of the COMPLEX working groups and the PPGs. They asked them to consider high-priority science themes and objectives and specific factors such as water depth range, maximum penetration, lithology, thermal gradients, minimum core recovery limits, maximum core disturbance limits, number of holes, sampling, testing, and logging needs, site survey needs, and environmental conditions. The CDC received thirty target sections and reduced these to nine synthetic target sections related to observatories, rifting processes, convergent margins, oceanic plateaus, hydrothermal massive sulfides, oceanic crust, passive-margin stratigraphy, deep-ocean sediments, and carbonate reefs, atolls, and banks. They determined that the ideal non-riser vessel would drill and keep station in a wide range of water depths (<20–10,000 m), operate globally for up to eight weeks without re-supply, and carry a shipboard party of sixty scientists. It would also have the capabilities to reach target depths of >2000 mbsf, deploy a total drill-string length of ~11,000 m, store sufficient mud and casing, sample continuously, and use the latest sampling, coring, and logging tools. After considering SciMP recommendations, OD21 plans, and consulting with IPSC, the CDC identified other basic shipboard requirements such as 1800 m^2 of heated and air-conditioned interior laboratory space, deck space for ten 20' core-storage reefers and five 20' special-purpose modules, and an underway geophysics lab on the stern.

The CDC contacted nineteen international ship owners to gather information about existing and planned drilling ships. They received twelve responses representing 31 of the 41 ships on their list and compiled an extensive summary of vessel characteristics and operating parameters. Some of the ships do not have dynamic positioning or other basic requirements. The CDC also discussed other platforms, such as geotechnical drilling ships, submersibles, and semi-submersible, jack-up rigs. Delaney distributed a draft survey report to the CDC in December 1999 and submitted a complete vessel survey to NSF in January 2000.

Cannat noted that the *JOIDES Resolution* appears on the CDC list and asked if it met the basic requirements. Delaney answered that every vessel on the list would require at least some modification. Hyndman suggested that the riser ship could also operate in non-riser mode, though not efficiently, and wondered if that might loosen the restrictions on the non-riser ship. Delaney said that the CDC considered whether a non-riser vessel could operate with a seafloor blowout prevention system to drill certain objectives, such as Santa Barbara Basin, and concluded that they would not expect the non-riser ship to do well-control drilling in water deeper than 500 m. They also concluded that shallower-water objectives that need well-control drilling might also require a riser platform and could pose the most difficulty. Hyndman asked whether the riser ship could handle certain deep-water objectives in non-riser mode. Delaney replied that they could set a

different screening depth for the total length of drill string, but that would not really change the number of vessels on the list. Fox asked whether any of the ships identified by the CDC already had long-term contracts that would preclude their availability at the start of the new program. Malfait said that NSF did not ask the CDC for that information and did not receive it. Larson asked how many of the ships would not fit through the Panama Canal, and Delaney said that about half of them would not. Beiersdorf asked if any of the ships had an ice-class rating. Delaney said that only one did, and in all likelihood, ice operations would require another vessel.

I.3 European Initiatives Report

Beiersdorf said that he had already covered this issue in other reports and summarized by saying that the European ocean-drilling community had begun working hard to supply a third leg to IODP. Ludden added that further discussion would take place on new ways to capitalize European involvement in IODP.

I.4 COMPLEX Report

Nick Pisias announced that the COMPLEX Report had reached the final stages of editing, and he expected to see it finished by the end of this month and published by the middle of March. Beiersdorf led EXCOM and SCICOM in applauding the completion of the COMPLEX report.

I.5 IPSC Report

Ted Moore reported on the status of the industrial-liaison, technical-advice, and science-plan working groups and said that the main effort of IPSC so far had focused on the latter group. The science-planning group began work in September and quickly drafted the Initial Science Plan, structured around three general scientific themes and subdivided into nine specific initiatives. The draft plan went for review by mid November and detailed reviews came back in a month. The review board recommended to 1) include an implementation strategy, 2) increase the emphasis on drilling the seismogenic zone, 3) strengthen the justification for a multi-platform drilling program, 4) shorten the document, and 5) correct errors in grammar, punctuation, and editing. IPSC had since named an *ad hoc* advisory group to devise an implementation strategy. They also had posted a revised science plan on the web for further review. Moore thought that the browser version worked best and asked about the experience of others in downloading the science plan. Larson said that the figures did not come out well in the downloadable version.

Moore presented a schedule for reviewing, revising, and submitting the Initial Science Plan. Purdy commented that the IWG had not yet approved that schedule. Robertson asked about the timing of finishing the remaining items of the science plan, and Detrick stressed the importance of seeing a complete document at some point and not just the partial one available now. Miller asked about the appropriate level of discussion and comment to engage in at this meeting. Beiersdorf supposed that everyone had not yet had a chance to read the plan carefully, but all should have an opportunity to provide input. Moore stated that he would like to receive written comments from the ODP community in the next few weeks. Mountain asked if IPSC expected to produce another version of the science plan. Moore replied that the next version would involve a serious rewrite. Beiersdorf congratulated IPSC for their progress on the science plan and asked about the deadline for providing input. Moore said that EXCOM would see the final draft in June.

Moore outlined the basic principles of the IODP scientific advisory structure. Although the new structure would look similar to the current one, it would also include a few new parts, such as a technical planning group, an industry advisory committee, an education committee, and detailed planning groups for riser legs. Harrison suggested that the science committee would have a greatly expanded workload because they would have to deal with multiple platforms. Moore, however, expected that the workload of the science committee would not increase much because the number of riser sites or alternate platforms used per year would remain low. Wiens wondered how the evaluation of riser sites would fit within the guise of the current advisory structure. Moore

acknowledged that it would require a lot of work, and he expected that the detailed planning groups would handle most of it. Wiens then asked if proposals would come from outside or within the detailed planning groups. Moore said that SCICOM would have to decide that. Pisias noted that one of the biggest challenges would stem from the much longer lead time needed for planning a riser drilling leg and how the panel structure would maintain that longer-term view. Moore suggested that planning for the first riser site could begin in 2003 or 2004 and perhaps for the second site before drilling starts at the first site. Ball said that SSP planned to discuss at its next meeting how their workload would change with respect to riser drilling. Beiersdorf noted that the new advisory structure would not begin taking shape for another two years, and for now IPSC only sought approval of the guiding principles rather than the details. Meanwhile, the current advisory structure had to develop a plan for phasing itself out, keeping in mind the contingency that a future program may or may not come into existence. Moore said that IODP would certainly have a different proportional representation than ODP, and he raised the question of how to review proposals during the transition to the new program before knowing its membership. Morris remarked that some proponents had already started showing concern about the continuity between programs. Moore suggested reminding proponents that NSF had already indicated a certain commitment to a new program. He thought proponents should also receive advice on the likelihood of seeing their proposal scheduled in the next program.

Moore reported that IPSC had discussed five possible management structures, and he diagrammed the two selected for further consideration. Miller noted that one of the management structures showed two project managers and asked if that would include two levels of archiving, publications, etc. Beiersdorf saw it as premature to address such details. Pisias wondered whether two project managers would suffice. Moore said that IPSC also discussed the needs for expanded shore-based labs, an expanded OPCOM, an engineering development office, database management and acquisition, science synthesis and educational outreach, improved science and technology exchange with industry, detailed planning groups for riser sites, and long-term monitoring. Coffin suggested that IODP would need a mechanism to ensure adequate site surveying and preparation, saying that industry typically devoted 10% of total drilling costs to such efforts. Moore cautioned that the site surveying necessary to justify a proposal differed from that necessary to justify safety. Hyndman also cited the high cost of riser drilling and associated site surveying, and said that the unlikely chance of getting approval for one without an advance commitment to the other meant that overall approval would have to come much earlier. Moore agreed and said that it would help to develop better ties with industry in this regard.

Beiersdorf felt satisfied with the outcome of the joint meeting and adjourned the committees at 5:00 PM.

JOIDES EXECUTIVE AND SCIENCE COMMITTEES JOINT MEETING

THE WASHINGTON MONARCH HOTEL
WASHINGTON, D.C.

15 FEBRUARY 2000

Executive Committee - EXCOM

Helmut Beiersdorf (Chair)	Bundesanstalt für Geowissenschaften und Rohstoffe, Germany
James Briden	Environmental Change Unit, Oxford University, United Kingdom
Maria C. Comas	Instituto Andaluz de Ciencias de la Tierra, Universidad de Granada, Spain, (ECOD)
G. Brent Dalrymple	College of Oceanic & Atmospheric Sciences, Oregon State University, USA
Robert Detrick	Woods Hole Oceanographic Institution, USA
Chris Harrison	Rosenstiel School of Marine & Atmospheric Science, University of Miami, USA
Richard Hiscott	Earth Sciences Department, Memorial University of Newfoundland, Canada (PacRim)
Dennis Kent	Department of Geological Sciences, Rutgers University, USA
Roger Larson	Graduate School of Oceanography, University of Rhode Island, USA
John Mutter	Lamont-Doherty Earth Observatory, Columbia University, USA
John Orcutt	Scripps Institution of Oceanography, University of California, San Diego, USA
David Prior	College of Geosciences, Texas A&M University, USA
C. Barry Raleigh	School of Ocean and Earth Science and Technology, University of Hawaii, USA
Paul Stoffa	Institute for Geophysics, University of Texas at Austin, USA
Asahiko Taira	Ocean Research Institute, University of Tokyo, Japan

Associate Member Observers - EXCOM

Mathilde Cannat	Laboratoire de Pétrologie, Université Pierre et Marie Curie, Paris, France
Wang Zhixiong	Marine High Technology Bureau, Beijing, China

Science Committee - SCICOM

Sherman Bloomer	Department of Geosciences, Oregon State University, USA
Millard Coffin	Institute for Geophysics, University of Texas at Austin, USA
Steven D'Hondt	Graduate School of Oceanography, University of Rhode Island, USA
Patricia Fryer	Department of Geology and Geophysics, University of Hawaii, USA
William Hay (Chair)	GEOMAR Research Center, University of Kiel, Germany
Nils Holm	Department of Geology and Geochemistry, Stockholm University, Sweden (ECOD)
Jock Keene	School of Geosciences, University of Sydney, Australia (PacRim)
Emily Klein	Department of Geology, Duke University, USA
Kenneth Miller	Department of Geological Sciences, Rutgers University, USA
Gregory Mountain[a]	Lamont-Doherty Earth Observatory, Columbia University, USA
David Rea	Department of Geological Sciences, University of Michigan, USA
Alastair Robertson	Department of Geology and Geophysics, University of Edinburgh, United Kingdom
Hidekazu Tokuyama[b]	Ocean Research Institute, University of Tokyo, Japan
Douglas Wiens	Department of Earth and Planetary Science, Washington University, USA
James Zachos[c]	Department of Earth Sciences, University of California, Santa Cruz, USA

Associate Member Observers - SCICOM

John Ludden	Centre de Recherches Pétrographiques et Géochimiques, CNRS-Nancy, France
Zhou Zuyi*	Department of Marine Geology & Geophysics, Tongji University, Shanghai, China

[a] Alternate for Gerard Bond
[b] Alternate for Yoshiyuki Tatsumi
[c] Alternate for J. Casey Moore
* Absent

Liaisons

Jack Baldauf	Ocean Drilling Program (ODP), Texas A&M University, USA
Jeff Fox	Ocean Drilling Program (ODP), Texas A&M University, USA
David Goldberg	Lamont-Doherty Earth Observatory (LDEO), Columbia University, USA
Neil Lundberg	Department of Geology, Florida State University, USA
Bruce Malfait	National Science Foundation (NSF), USA
Kathryn Moran	Joint Oceanographic Institutions (JOI), Inc., USA
Julie Morris	Department of Earth and Planetary Science, Washington University, USA

Guests

James Allan	National Science Foundation (NSF), USA
James Austin	Institute for Geophysics, University of Texas at Austin, USA
Mahlon Ball	U.S. Geological Survey, Denver, USA
Keir Becker	Rosenstiel School of Marine & Atmospheric Science, University of Miami, USA
J. Paul Dauphin	National Science Foundation (NSF), USA
Margaret Delaney	Department of Ocean Sciences, University of California, Santa Cruz, USA
John Diebold	Lamont-Doherty Earth Observatory, Columbia University, USA
Sören Dürr	Deutsche Forschungsgemeinschaft (DFG), Germany
John Farrell	Joint Oceanographic Institutions (JOI), Inc., USA
Chris Franklin	Natural Environmental Research Council (NERC), United Kingdom
James Gill	Department of Earth Sciences, University of California, Santa Cruz, USA
J. Frederick Grassle	Department of Geological Sciences, Rutgers University, USA
Roy Hyndman	Geological Survey of Canada, Sidney, B.C., Canada
Tom Janecek	Antarctic Research Facility, Florida State University, USA
Hajimu Kinoshita	Japan Marine Science and Technology Center (JAMSTEC), Japan
Kazuhiro Kitazawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Shin'ichi Kuramoto	Science and Technology Agency (STA), Japan
Ted Moore	Department of Geological Sciences, University of Michigan, USA
Arthur Nowell	School of Oceanography, University of Washington, USA
Robert Owen	Department of Geological Sciences, University of Michigan, USA
Nicklas Pisias	College of Oceanic & Atmospheric Sciences, Oregon State University, USA
Warren Prell	Department of Geological Sciences, Brown University, USA
Michael Purdy	National Science Foundation (NSF), USA
Mary Reagan	Lamont-Doherty Earth Observatory, Columbia University, USA
Masanori Shinano	International Working Group (IWG) Support Office, USA
Thomas Shipley	Institute for Geophysics, University of Texas, USA
Shiri Srivastava	Geological Survey of Canada Atlantic, Bedford Institute of Oceanography, Canada
Neil Sullivan	Department of Physics, University of Florida, USA
Kiyushi Suyehiro	Japan Marine Science and Technology Center (JAMSTEC), Japan
Shinichi Takagawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Takeo Tanaka	Japan Marine Science and Technology Center (JAMSTEC), Japan
Philippe Vidal	Centre National de la Recherche Scientifique (CNRS), Paris, France
James Watkins	Joint Oceanographic Institutions (JOI), Inc., USA
Robert Winokur	Consortium for Oceanographic Research and Education (CORE), USA

JOIDES Office

Warner Brückmann	GEOMAR Research Center, University of Kiel, Germany
Bettina Rohr	GEOMAR Research Center, University of Kiel, Germany
Jeffrey Schuffert	GEOMAR Research Center, University of Kiel, Germany

JOIDES EXECUTIVE COMMITTEE MEETING

THE WASHINGTON MONARCH HOTEL
WASHINGTON, D.C.

16 FEBRUARY 2000

Executive Committee - EXCOM

Helmut Beiersdorf (Chair)	Bundesanstalt für Geowissenschaften und Rohstoffe, Germany
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Richard Hiscott	Earth Sciences Department, Memorial University of Newfoundland, Canada (PacRim)
Dennis Kent	Department of Geological Sciences, Rutgers University, USA
Roger Larson	Graduate School of Oceanography, University of Rhode Island, USA
John Mutter	Lamont-Doherty Earth Observatory, Columbia University, USA
John Orcutt	Scripps Institution of Oceanography, University of California, San Diego, USA
David Prior	College of Geosciences, Texas A&M University, USA
C. Barry Raleigh	School of Ocean and Earth Science and Technology, University of Hawaii, USA
Paul Stoffa	Institute for Geophysics, University of Texas at Austin, USA
Asahiko Taira	Ocean Research Institute, University of Tokyo, Japan

Associate Member Observers

Mathilde Cannat	Laboratoire de Pétrologie Université Pierre et Marie Curie, Paris, France
Wang Zhixiong	Marine High Technology Bureau, Beijing, China

Liaisons

Jeff Fox	Ocean Drilling Program (ODP), Texas A&M University, USA
David Goldberg	Lamont-Doherty Earth Observatory (LDEO), Columbia University, USA
William Hay	GEOMAR Research Center, University of Kiel, Germany
Bruce Malfait	National Science Foundation (NSF), USA
Kathryn Moran	Joint Oceanographic Institutions (JOI), Inc., USA

Guests

James Austin	Institute for Geophysics, University of Texas at Austin, USA
Jack Baldauf	Ocean Drilling Program (ODP), Texas A&M University, USA
J. Paul Dauphin	National Science Foundation (NSF), USA
Sören Dürr	Deutsche Forschungsgemeinschaft (DFG), Germany
John Farrell	Joint Oceanographic Institutions (JOI), Inc., USA
Chris Franklin	Natural Environmental Research Council (NERC), United Kingdom
James Gill	Department of Earth Sciences, University of California, Santa Cruz, USA
J. Frederick Grassle	Department of Geological Sciences, Rutgers University, USA
Hajimu Kinoshita	Japan Marine Science and Technology Center (JAMSTEC), Japan
Kazuhiro Kitazawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Emily Klein	Department of Geology, Duke University, USA
Shin'ichi Kuramoto	Science and Technology Agency (STA), Japan
Ted Moore	Department of Geological Sciences, University of Michigan, USA
Arthur Nowell	School of Oceanography, University of Washington, USA
Robert Owen	Department of Geological Sciences, University of Michigan, USA
Michael Purdy	National Science Foundation (NSF), USA
David Rea	Department of Geological Sciences, University of Michigan, USA
Neil Sullivan	Department of Physics, University of Florida, USA
Shinichi Takagawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Takeo Tanaka	Japan Marine Science and Technology Center (JAMSTEC), Japan
Philippe Vidal	Centre National de la Recherche Scientifique (CNRS), Paris, France
James Watkins	Joint Oceanographic Institutions (JOI), Inc., USA

JOIDES Office

Jeffrey Schuffert	GEOMAR Research Center, University of Kiel, Germany

JOIDES EXECUTIVE COMMITTEE MEETING

THE WASHINGTON MONARCH HOTEL
WASHINGTON, D.C.

16 FEBRUARY 2000

DRAFT MOTIONS

EXCOM Consensus 00-1-1
EXCOM approves the agenda for the January 2000 meeting.

Harrison proposed, Briden seconded; approved by consensus.

EXCOM Motion 00-1-2
EXCOM approves the minutes of the June 1999 meeting.

Briden proposed, Detrick seconded; 15 in favor.

EXCOM Consensus 00-1-3
EXCOM recommends that JOI develop a preliminary ODP phase-out plan for comment by the JOIDES Advisory Structure and for presentation at the June 2000 EXCOM meeting.

Presented by Kent.

EXCOM Consensus 00-1-4
EXCOM commends IPSC and its working groups for their excellent progress in developing an IODP Science Plan over a very short period of time and for their consideration of the various management and operational issues associated with the development of IODP. We look forward to a further update on these planning efforts at our June 2000 meeting.

EXCOM will provide comments to the IPSC Chair on the draft IODP Science Plan and suggest potential reviewers of the plan from among a broad range of earth and ocean scientists. EXCOM also requests SCICOM to provide similar input to IPSC.

Presented by Detrick.

EXCOM Motion 00-1-5
EXCOM approves a science plan for FY2001 and beyond that includes the following programs:

479-Full3	Manus Basin
510 Full3	Marion Plateau
431-Rev	W. Pacific ION Network (WP-1)
517-Full	Nankai II (with LWD and advanced CORKs)
523-Full	Hawaii Emperor Seamounts
546-Full	Hydrate Ridge
486-Rev	Equatorial Pacific Paleogene Transect

Detrick proposed, Kent seconded; 13 in favor, 2 abstained (Orcutt, Taira).

EXCOM Motion 00-1-6
EXCOM endorses SCICOM Motion 00-1-1 regarding the Distance Learning initiative.

Harrison proposed, Mutter seconded; 14 in favor, 1 abstained (Prior).

EXCOM Motion 00-1-7
EXCOM advises the JOIDES office to ensure that a non-conflicted alternate member replaces, for the relevant business, any SCICOM member with a conflict of interest on a drilling proposal considered by SCICOM.

Briden proposed, Orcutt seconded; 15 in favor.

EXCOM Motion 00-1-8
EXCOM amends the Terms of Reference regarding appointment of PPG liaisons, as requested in SCICOM Motion 99-2-26.

Hiscott proposed, Harrison seconded; 15 in favor.

EXCOM Consensus 00-1-9
EXCOM endorses the following plan for developing closer relations with ICDP.

1. SCICOM will send an observer to the ICDP meeting on 3-4 April 2000 in Merida, Mexico.
2. ICDP will send an observer to the SSEPs meeting on 6-10 May 2000 in Cambridge, U.K., and to the SCICOM/OPCOM meeting on 1-4 August 2000 in Halifax, Nova Scotia, Canada.
3. TEDCOM should arrange to meet with ICDP drilling technology counterparts on 22-23 May 2000 in Potsdam, Germany.

Presented by Mutter.

EXCOM Consensus 00-1-10
EXCOM bids a fond farewell to Jim Briden. We cannot imagine an EXCOM meeting without Jim! His dedication to ODP and his ardent support for ocean drilling have marked his nearly 15 years of extraordinary service on EXCOM. As Chair of EXCOM between 1994-96, Jim successfully navigated the program throughout the run-up to Phase 3 renewal and played an instrumental role in maintaining the U.K. as a full partner in ODP. We express our gratitude to Jim for his long service and many contributions over nearly half the history of scientific ocean drilling. We wish Jim well for the future and look forward to his involvement in some capacity in the new IODP.

Presented by Detrick.

EXCOM Consensus 00-1-11
Over the last day and a half at this unique joint meeting of the JOIDES EXCOM and SCICOM, we have focused much of our attention on the changes and uncertainties that the future will surely hold for scientific ocean drilling. Even the most visionary of our members looks to 2003 and beyond and perceives only a clouded vision of the future. In such times of flux, we always seek a strong pillar of security to brace ourselves against as the winds of change whip around us. For eleven years, Arthur Nowell has served as that pillar for the Ocean Drilling Program. His unflurried wisdom has provided a deep keel that has helped us sail many times through troubled water. But now, as the storm clouds of uncertainty begin massing on the horizon, he will leave us—just when we need him most. But Arthur apparently operates on the same time scale as the sun spot cycle; eleven years have passed and so he must move on. Arthur, we will miss your sage council in our moments of stress. But most of all we will miss your ability to see over the horizon. This program stands immeasurably better for your devoted service and we thank you for it. We all owe you a great debt.

Presented by Mutter.

EXCOM Consensus 00-1-12
Whereas Margaret Leinen has served as our esteemed colleague on EXCOM for the past 10 years, and whereas she has provided a voice of reason and an unfailing source of wisdom in our deliberations, thereby having earned our profound respect and gratitude, and whereas the National Science Foundation has, in its wisdom and uncommonly good judgement, selected Margaret as its Assistant Director for the GEO Division, and whereas Margaret must now withdraw from membership on EXCOM, EXCOM hereby resolves that her famous EXCOM motion shall remain, in perpetuity, the longest ever passed, and we anticipate that her tenure as an Assistant Director at NSF will prove as brilliantly successful as her previous career, and we hope to continue enjoying the great pleasure of her company as often as her new responsibilities permit.

Presented by Raleigh.

JOIDES EXECUTIVE COMMITTEE MEETING

THE WASHINGTON MONARCH HOTEL
WASHINGTON, D.C.

16 FEBRUARY 2000

DRAFT MINUTES

A. Approval of June 1999 EXCOM Minutes and Matters Arising
Beiersdorf opened the separate portion of the EXCOM meeting and asked the participants to introduce themselves. He also noted several changes to the agenda and called for its approval.

EXCOM Consensus 00-1-1
EXCOM approves the agenda for the January 2000 meeting.

Harrison proposed, Briden seconded; approved by consensus.

Beiersdorf asked for approval of the minutes from the previous EXCOM meeting. Hiscott first requested a minor change regarding the PacRim report, and all approved.

EXCOM Motion 00-1-2
EXCOM approves the minutes of the June 1999 meeting.

Briden proposed, Detrick seconded; 15 in favor.

B. ODP Phase-Out and ODP/IODP Transition
Beiersdorf presented timeline diagrams for the phase-out of ODP. He reiterated the goals of the phase-out and emphasized that it must consider the advent of the new program. Beiersdorf also noted that existing MOUs do not cover the post-2003 portion of the phase-out. Furthermore, the new advisory structure must reflect equal participation by the U.S. and Japan, whereas the commitment level of other international partners remains unknown. Beiersdorf recognized the difficulty of planning the phase-out and listed several important elements for consideration. He said that EXCOM as a policy-making body has to decide how to develop the final phase-out plan and initiate that activity as soon as possible because NSF needs an outline in one year. Beiersdorf proposed establishing a small working group for devising the phase-out plan. He recommended first establishing a small subcommittee to develop a mandate, task list, generic membership criteria, and a list of potential candidates for the working group. Beiersdorf said that the working group would depend on volunteers, and the final planning might require a dedicated person, but first we need an outline or strategy, something similar to what we did with IPSC.

Cannat returned to the question from the previous day about what would happen to proposals. Beiersdorf said that the phase-out plan must certainly address that issue. Larson thought that DSDP proposals did not carry over to ODP, but Austin said that ODP at first used some existing proposals from DSDP. Hiscott asked if DSDP had a phase-out plan. Malfait answered that DSDP did have a funded phase-out plan that lasted four or five years. Briden thought that the timeline looked desperately late, with only 18 months between acceptance of the plan and throwing away the key. He also did not view the forthcoming transition as any smoother than the previous one because the timeline showed an 18-month hiatus between programs. Malfait explained that JOI must submit a final program plan to NSF, whereas the hiatus represents a separate issue controlled by the funding and membership arrangements of the new program as well as the need for resources in 2004 to capitalize a drilling vessel.

Detrick recognized the importance and difficulty of developing a phase-out plan but felt that the timeframe and exact concept remained unclear. Beiersdorf said that the subcommittee would start immediately after this meeting and must finish by the next EXCOM meeting in June. The subcommittee would draft a mandate and task list for the working group and contact potential

members. If we establish the working group at the June meeting and they produce a final outline no later than one year from now, then we would fall in line with the NSF goal to have a comprehensive phase-out plan laid out by early 2002. Briden said that the proposed duality of the phase-out plan made it difficult to envision the membership of the working group. He assumed that the working group would need involvement from TAMU, but this would create a conflict of interest for planning the phase-in of the new program. Beiersdorf said that the working group would provide only an outline and not the final plan, so they would not necessarily need a member from TAMU. Orcutt noted that the proposed process emphasized the phase-out plan, whereas the phase-in of IODP presumably fell under the responsibility of IPSC. Beiersdorf said the outline of the phase-out plan would have to consider the new program. Raleigh asked to whom the working group would report and questioned whether they could plan the phase-out while working around the fact that JOI supplies the funds to the advisory structure and the operators. Beiersdorf said that the working group would report to EXCOM, but clearly would have to maintain contact with JOI and the operators. He expected that the final phase-out plan would incorporate all those elements that deal with financial issues, but according to a definite outline that must avoid any conflicts of interest. Beiersdorf stressed that the subcommittee had to start now and the working group, knowledgeable on the scientific, financial, and legal aspects of the program, had to start no later than August 2000. He added that EXCOM would disband the working group upon accepting their report.

Briden supported the proposal to establish a subcommittee, calling it a modest effort. Raleigh expressed concern about imposing something on JOI that they could not handle, and he wanted to ensure that JOI would conduct their own planning, sooner rather than later. He envisioned the phase-out plan as requiring a full-time effort from someone at JOI and said that EXCOM could not simply give JOI a mandate on how to do the job. Beiersdorf insisted that EXCOM had to provide JOI with an outline, otherwise JOI would do as it sees fit. Malfait noted that the MOUs and contracts already specified many aspects of the phase-out. He therefore saw it more as a need for a statement of the phase-out rather than a detailed plan. Watkins stated the JOI BoG had reviewed the phase-out timeline carefully at its meeting in Sydney. He explained that JOI ideally needs to know one year in advance what each element of the timeline means, though they had already pushed well ahead without knowing anything but the constraining dates. Beiersdorf believed that the picture would get clearer as the end approached, but he could not imagine that JOI alone could consider every aspect of the phase-out. Watkins said that JOI did not have a complete phase-out plan, but they did have a long list of things they needed to know to meet their contractual obligations, and they could not get there from here without doing their homework well in advance. Kent suggested that the advisory structure should entertain proposals for the phase-out from JOI itself, rather than establish a working group concerned with financial and legal complexities. Raleigh agreed that JOIDES should advise JOI and comment on their plans, rather than do it twice and have a committee focused only on the phase-out and not the phase-in.

Beiersdorf asked from whom NSF expected to receive the final phase-out plan. Malfait restated that JOI must submit the program plan for phasing out the contractors with respect to their participation in ODP. Beiersdorf asked if that included phasing out the advisory structure. Malfait answered that it would include phasing out the support to the JOIDES advisory structure. Beiersdorf thought NSF expected advice from the advisory structure on phasing out ODP. Malfait said only in the sense that JOIDES advises JOI on the program. Beiersdorf still doubted that JOI held responsibility for phasing out the advisory structure. Briden said that JOI must have that responsibility because JOIDES represents an entity of JOI in contractual terms. Malfait believed that the MOUs defined JOIDES in terms of the program membership, whereas JOI has the responsibility to provide the administrative support for JOIDES. Briden then saw it as a question of whether EXCOM or JOI initiated the phase-out planning activity. Beiersdorf said that it would simplify the task of the JOIDES advisory structure if JOI could plan the phase-out. Dalrymple said

that if JOIDES derives from the MOUs then perhaps NSF has the responsibility for phasing out JOIDES. Larson reminded everyone that a collection of scientists created ODP, not JOI or NSF; therefore, the science advisory structure should hold the responsibility for its own phase-out. Beiersdorf doubted whether JOI had the resources to develop the phase-out plan and said that EXCOM could disband the working group if it did not work. Comas agreed that EXCOM held the responsibility for the phase-out, and she supported establishing an independent working group.

Kent suggested moving ahead and establishing the subcommittee of EXCOM and letting them solicit a preliminary plan from JOI for the next EXCOM meeting, then we can decide whether we need a more elaborate parallel structure to continue the planning. Taira agreed that EXCOM had to start working immediately on the phase-out plan. Beiersdorf said that EXCOM had to define the expected outcome of these proposals. Kent suggested that the subcommittee could serve as a standing body that would report to EXCOM at each meeting, and he presented a draft motion calling for JOI to develop a phase-out plan. Malfait worried that the phase-out plan would consider only operational issues, with no statement of the intellectual legacy or scientific achievements of ODP. Beiersdorf agreed on the importance of addressing those aspects in the phase-out plan. Hay said that SCICOM had started planning for beyond 2003, but had not considered the issue of summarizing the accomplishments in this program. Kent felt uncertain whether such a summary belonged in the phase-out plan and suggested waiting to see the plan presented by JOI at the next meeting. Harrison thought that JOIDES should identify the scientific achievements of ODP and not JOI. Beiersdorf said that EXCOM must decide how to proceed once JOI comes back with proposal.

EXCOM Consensus 00-1-3
EXCOM recommends that JOI develop a preliminary ODP phase-out plan for comment by the JOIDES Advisory Structure and for presentation at the June 2000 EXCOM meeting.

Presented by Kent.

C. Discussion of IPSC Report and Presentation of SCICOM Suggestions
David Rea summarized the SCICOM discussion of the IODP Initial Science Plan. He said that certain sections of the plan needed strengthening, including those on mantle tomography, sea-level change, Arctic drilling, continental breakup and sedimentary basin formation, and borehole monitoring. Furthermore, the science plan needed to emphasize better the seismogenic zone as a primary thrust of IODP. Rea suggested that perhaps an executive summary could address some of those issues, but the last one especially needed greater prominence. Mutter asked whether SCICOM felt pleased with the basic idea to emphasize the seismogenic zone as the lead component of the plan, and Rea answered yes. Detrick remarked that a riser leg might represent a culmination of effort that also involved non-riser drilling.

Detrick said that he had difficulty in getting a sense of the whole plan from reading the partial document available now, and asked whether the plan would receive further review. Moore said that he hoped to mail out a 95% complete draft by March for review by an international group of respected scientists. Beiersdorf asked about the type of person envisioned for that review. Moore replied that IPSC only has time for one more good review and rewrite before they produce something for IWG, but it could prove useful at this stage to have reviewers from outside ODP. Briden asked if the time had arrived to involve people from the National Academy level. Purdy said that the best timing for that would depend on input from individual countries, and IWG would discuss it tomorrow. He foresaw that IWG would establish a review process to produce a final plan for use by individual nations to solicit funds internally. Moore suggested that each country or consortium might want to write their own prolog to this document, as the U.S. plans to do. He added that IPSC would like to receive an official list of about twenty potential reviewers. Beiersdorf called for EXCOM members to nominate candidates and said that SCICOM should assist in finding the proper assembly of people.

Rea summarized the SCICOM discussion of the IODP science advisory structure and management models proposed by IPSC. He said that SCICOM expressed the most concern about the lack of an advisory group dedicated explicitly to alternate platforms. SCICOM therefore suggested establishing Detailed Planning Groups as necessary for riser, non-riser, and alternate platforms. SCICOM also believed that the advisory structure would have to provide a centralized source of advice for leading prospective proponents through the process of developing and submitting drilling proposals for the different platforms, and they wondered specifically how the new system would handle large complex riser proposals. Rea said that SCICOM also wondered whether IODP would need a separate management structure for alternate platforms, but they realized that any recommendations in that regard had to wait for a clearer picture to emerge on the overall financial commitments to the new program. Moore said that other elements of IODP would certainly require management, but first we need to define the managerial activities before we decide where they fit in the overall structure.

D. Discussion of IPSC Report and Presentation of SCICOM Suggestions (continued)
Beiersdorf noted several aspects of the IPSC report and other related issues that would arise in IWG and asked for further comments. Detrick believed that the implementation component of the science plan might require another review group because he doubted whether the new program could accomplish all of the science described in the science plan in ten or fifteen years. Orcutt suggested that SCICOM should review and comment on the scientific issues associated with borehole monitoring and other technical goals of the science plan. Moore raised the question of who would pay for monitoring efforts once we install borehole instruments. Stoffa returned to the issue of the greater needs and costs for site surveying associated with riser drilling. Mutter said that the academic fleet does not have the capacity to do site surveys for riser legs, and he identified the need for a more sophisticated database than what we have now to manage the output of the more complicated 3-D surveys. Beiersdorf said that these issues definitely required further consideration, but it might depend on individual countries to satisfy those needs, perhaps through special initiatives directed toward specific projects.

Beiersdorf stated that EXCOM needed to give an overall evaluation of the IPSC report. He recommended encouraging IPSC to consider the comments of EXCOM and SCICOM and proceed accordingly. Detrick presented the following statement and Beiersdorf called for its approval by consensus.

EXCOM Consensus 00-1-4
EXCOM commends IPSC and its working groups for their excellent progress in developing an IODP Science Plan over a very short period of time and for their consideration of the various management and operational issues associated with the development of IODP. We look forward to a further update on these planning efforts at our June 2000 meeting.

EXCOM will provide comments to the IPSC Chair on the draft IODP Science Plan and suggest potential reviewers of the plan from among a broad range of earth and ocean scientists. EXCOM also requests SCICOM to provide similar input to IPSC.

Presented by Detrick.

E. Approval of FY2001 Science Plan
Hay presented the FY2001 science plan for approval and described how OPCOM and SCICOM had determined the schedule. Hay also showed a map of the proposed ship track, noting the proposed switch of Hydrate Ridge from Leg 198 to 199 so that it would occur in the next fiscal year. Hay then briefly described the science plan for each leg, including those already scheduled beyond FY2001. Hay commended SCICOM for doing a good job at the last meeting in presenting proposals and deciding upon the schedule.

Beiersdorf asked Hay to explain exactly how the science plan complied with the long-range plan. Hay did so on a leg-by-leg basis and Beiersdorf felt satisfied with the plan. Hay suggested approving the science plan beyond FY2001 to allow flexibility in switching Legs 198 and 199 for budgetary reasons. Beiersdorf agreed and called for approval from EXCOM. Orcutt and Taira each declared that they had a conflict of interest and would abstain from approving the FY2001 science plan.

EXCOM Motion 00-1-5
EXCOM approves a science plan for FY2001 and beyond that includes the following programs:

479-Full3	Manus Basin
510 Full3	Marion Plateau
431-Rev	W. Pacific ION Network (WP-1)
517-Full	Nankai II (with LWD and advanced CORKs)
523-Full	Hawaii Emperor Seamounts
546-Full	Hydrate Ridge
486-Rev	Equatorial Pacific Paleogene Transect

Detrick proposed, Kent seconded; 13 in favor, 2 abstained (Orcutt, Taira).

F.1 Distance Learning Initiative from SCICOM
Klein presented the following draft motion from SCICOM regarding the Distance Learning Initiative.

SCICOM Motion 00-1-1
SCICOM endorses sailing a secondary education science teacher aboard the *JOIDES Resolution*, assuming minimal impact on leg scientific staffing. SCICOM also endorses the time resources required of ODP/TAMU staff (a total of 12 weeks or 2 weeks/FTE) to complete the Distance Learning Initiative. SCICOM requests ODP/TAMU to prepare a final report on the pilot project that would include recommendations for internationalizing this educational outreach program.

Larson asked what SCICOM meant by a "minimal impact on leg scientific staffing". Klein said that it could mean one less scientist, though SCICOM hoped that the teacher would contribute to shipboard science. Briden asked if the pilot project represented essentially a U.S. effort. Klein explained that the State of Texas had funded the project for outreach to middle schools in Texas. SCICOM hoped that it would expand internationally, but such an effort would most likely require international support. Briden said that his national agency did not have a mandate to support educational work. Kent asked about the process for selecting the teacher. Baldauf described it as a competitive process, eventually on a national or international scale to achieve broader appeal and publicity. Mutter wondered whether ODP could afford to replace 2% of the science party and asked who would submit the final report. Baldauf said that TAMU would submit the final report. Klein reemphasized the fact that an external organization had contributed $350K in funding for this project. Prior added that the total support from Texas probably amounts to more like $450K considering the involvement of TAMU faculty.

EXCOM Motion 00-1-6
EXCOM endorses SCICOM Motion 00-1-1 regarding the Distance Learning initiative.

Harrison proposed, Mutter seconded; 14 in favor, 1 abstained (Prior).

F.2 SCICOM ranking and voting procedure.
Hay explained that he foresaw a problem in maintaining a quorum during the SCICOM scheduling meeting in August 2000. He stated that according to the Terms of Reference for SCICOM, "A quorum shall consist of at least two-thirds of the non-U.S. members and at least two-thirds of the U.S. members." Hay also stated that one of the five non-U.S. members and four of the ten U.S. members would have a direct conflict of interest as proponents of drilling proposals under

consideration by SCICOM at its next meeting. In other words, SCICOM would lack a quorum and therefore could not make any official decisions on ranking and scheduling proposals.

Briden commended the JOIDES Office for anticipating this problem and said that only two possible solutions exist. Either 1) replace at least two of the conflicted U.S. members with non-conflicted alternates, try to replace the conflicted non-U.S. member with a non-conflicted alternate, and ensure that no other conflicted members or alternates would attend, or 2) change the rules to relax the restriction against voting by conflicted members. Briden noted that this problem had never arisen before in the three-year history of the current JOIDES advisory structure. He therefore advocated the first approach of working within the existing rules. Comas also favored the first solution because voting rights belonged to the countries and consortia, not the individual members. Raleigh asked why the U.S. should replace only two of its four conflicted members. Briden said that that would suffice to achieve a quorum.

Beiersdorf called for a motion to advise SCICOM on solving the problem. Briden presented a motion and noted that the JOIDES Office would have to inform the conflicted members. Hiscott asked whether the phrase "relevant business" referred to the whole meeting or just the ranking and voting process. Briden preferred to leave it ambiguous and thus allow the national programs the option to decide if the alternate and regular members would attend the meeting or just the alternate.

EXCOM Motion 00-1-7
EXCOM advises the JOIDES office to ensure that a non-conflicted alternate member replaces, for the relevant business, any SCICOM member with a conflict of interest on a drilling proposal considered by SCICOM.

Briden proposed, Orcutt seconded; 15 in favor.

F.3 Amend Terms of Reference
Hay presented the following request from SCICOM to amend the terms of reference regarding the appointment of liaisons to Program Planning Groups (PPGs).

SCICOM Motion 99-2-16
SCICOM requests EXCOM to amend the Terms of Reference for Program Planning Groups as follows:

6.5 **Liaison.** ~~SCICOM establishes liaison with the PPGs by the appointment of non-voting liaisons~~. The SSEPs will appoint liaisons to the PPGs, and ~~The~~ PPG Chairs ~~will~~ may attend one meeting of the SSEPs per year, ~~as~~ if requested by the SSEPs Chairs.

In the absence of any further discussion, Beiersdorf called for a motion to amend the terms of reference as requested.

EXCOM Motion 00-1-8
EXCOM amends the Terms of Reference regarding appointment of PPG liaisons, as requested in SCICOM Motion 99-2-26.

Hiscott proposed, Harrison seconded; 15 in favor.

F.4 Relationship with International Continental Drilling Program (ICDP)
Mutter presented a plan for enhancing cooperation between ODP and ICDP, as discussed earlier in the meeting. The plan called for an exchange of information on proposal review and schedule development, specifically through an exchange of liaisons between programs. It also proposed that TEDCOM should hold its next meeting with a counterpart group from ICDP to discuss ways for cooperating in technology development and equipment use. Comas indicated that ECOD members would have to approach such an initiative country by country, but the path of communication did not look open. Beiersdorf explained that this plan represented only an initial step, and he believed that ODP should proceed enthusiastically and find out how far it could go. Comas agreed

completely and said that she just wanted to raise the point. Larson asked if the ODP liaison would come from SCICOM, and Hay answered yes. Beiersdorf called for EXCOM to endorse the plan and all approved by consensus.

EXCOM Consensus 00-1-9
EXCOM endorses the following plan for developing closer relations with ICDP.
1. SCICOM will send an observer to the ICDP meeting on 3-4 April 2000 in Merida, Mexico.
2. ICDP will send an observer to the SSEPs meeting on 6-10 May 2000 in Cambridge, U.K., and to the SCICOM/OPCOM meeting on 1-4 August 2000 in Halifax, Nova Scotia, Canada.
3. TEDCOM should arrange to meet with ICDP drilling technology counterparts on 22-23 May 2000 in Potsdam, Germany.

Presented by Mutter.

G. Evaluation of Joint Meeting
Beiersdorf thought that the joint meeting had saved resources, heightened communication, and still allowed EXCOM to accomplish all of its business. Larson noted that it also helped to reduce the redundancy of reporting from managers, etc. Briden wondered whether SCICOM had benefited from the joint meeting, but Hay had just left the room and could not comment. Hiscott suggested that it might work better to stagger the EXCOM and SCICOM meetings with one day of overlap because Hay could not attend part of his own meeting. Harrison asked if SCICOM would schedule any additional meetings this year. Beiersdorf replied that EXCOM and SCICOM would continue to hold only two meetings per year and added that we could hold another joint meeting in the future if needed, but we do not have many meetings left in the program

H. Other Business
Beiersdorf raised the issue of who should supply the International Liaison to the next JOIDES Office in the U.S. He suggested that the liaison should come from Japan. Harrison noted that the University of Miami had submitted a bid for the next JOIDES Office and had specifically requested a liaison from Japan. Beiersdorf deferred further discussion of this issue until learning more about the process for selecting the past international liaisons.

EXCOM Consensus 00-1-10
EXCOM bids a fond farewell to Jim Briden. We cannot imagine an EXCOM meeting without Jim! His dedication to ODP and his ardent support for ocean drilling have marked his nearly 15 years of extraordinary service on EXCOM. As Chair of EXCOM between 1994-96, Jim successfully navigated the program throughout the run-up to Phase 3 renewal and played an instrumental role in maintaining the U.K. as a full partner in ODP. We express our gratitude to Jim for his long service and many contributions over nearly half the history of scientific ocean drilling. We wish Jim well for the future and look forward to his involvement in some capacity in the new IODP.

Presented by Detrick.

EXCOM Consensus 00-1-11

Over the last day and a half at this unique joint meeting of the JOIDES EXCOM and SCICOM, we have focused much of our attention on the changes and uncertainties that the future will surely hold for scientific ocean drilling. Even the most visionary of our members looks to 2003 and beyond and perceives only a clouded vision of the future. In such times of flux, we always seek a strong pillar of security to brace ourselves against as the winds of change whip around us. For eleven years, Arthur Nowell has served as that pillar for the Ocean Drilling Program. His unflurried wisdom has provided a deep keel that has helped us sail many times through troubled water. But now, as the storm clouds of uncertainty begin massing on the horizon, he will leave us, just when we need him most. But Arthur apparently operates on the same time scale as the sun spot cycle; eleven years have passed and so he must move on. Arthur, we will miss your sage council in our moments of stress. But most of all we will miss your ability to see over the horizon. This program stands immeasurably better for your devoted service and we thank you for it. We all owe you a great debt.

Presented by Mutter.

EXCOM Consensus 00-1-12

Whereas Margaret Leinen has served as our esteemed colleague on EXCOM for the past 10 years, and whereas she has provided a voice of reason and an unfailing source of wisdom in our deliberations, thereby having earned our profound respect and gratitude, and whereas the National Science Foundation has, in its wisdom and uncommonly good judgement, selected Margaret as its Assistant Director for the GEO Division, and whereas Margaret must now withdraw from membership on EXCOM, EXCOM hereby resolves that her famous EXCOM motion shall remain, in perpetuity, the longest ever passed, and we anticipate that her tenure as an Assistant Director at NSF will prove as brilliantly successful as her previous career, and we hope to continue enjoying the great pleasure of her company as often as her new responsibilities permit.

Presented by Raleigh.

I. Future Meetings

Beiersdorf reminded everyone about the next EXCOM meeting scheduled for 27-28 June 2000 in College Station, Texas. He also announced that Japan had agreed to host the first meeting in 2001, as previously discussed, and noted that it should not conflict with the USSAC meeting already scheduled for 24-26 Jan 2001. Beiersdorf then suggested that the U.K. should host the second meeting in 2001.

Taira proposed the dates of 29 Jan - 2 Feb 2001 for the meeting in Japan. Larson suggested meeting in the middle of February. Taira then proposed the dates of 14-15 Feb 2001. Austin objected that mid-week dates preclude a Saturday stay-over and reduced airfares. Taira said that he would work on determining the best dates.

Beiersdorf thanked JOI for hosting the meeting and adjourned the committee at 2:45 PM.

NSF REPORT

ODP

The fiscal year 2000 (1 October 1999 – 30 September 2000) ODP Program Plan was initially approved at a level of $46.1M, which included a modest increase of $600,000 in support for program base costs. In early April NSF approved transfer of $479,000 in unobligated FY 1999 funds to support FY 2000 activity. These funds are to be used to support tests of the Hard Rock Rentry system, tests of measurement-while-drilling equipment on Leg 188, industry liaison activities, and equipment purchases for the new microbiology laboratory on the Resolution. Funding of the new approved program budget ($46.579M) is complete through July, with remaining funding dependent on timely contribution from international partners. Rapidly rising fuel costs are a concern with respect to FY 2000 budgeting and resources. It is expected that JOI will provide further information on the status of this problem at the EXCOM meeting. NSF will supply approximately 64% of FY 2000 funding, with the remaining 36% to be provided by international contributions.

For FY 2001, NSF has given JOI a target budget of $46.1M to support all 2001 program activity. The Program Plan developed by JOI for 2001 will be presented to EXCOM for approval at this meeting, prior to its formal submission to NSF in August. No significant changes in international participation are expected for FY 2001. The European Science Foundation Consortium has added Ireland as a new member beginning in FY 2000. The total ESF Consortium contribution will therefore increase from 99.1% (2000) of full membership to 99.5% for 2001. NSF and the Ministry of Science and Technology in China are approaching final agreement on extension of China's participation in the ODP into 2003. China will continue to participate as an associate member with no change in contribution level. India has been approached by JOI as part of the ODP internationalization program to participate as an associate member. Additionally, the PACRIM consortium has approached India as a potential new member of the consortium.

The directorship of Ocean Drilling Programs at JOI became vacant on 22 February following the departure of Dr. Kate Moran. Effective 1 March, NSF approved the appointment of Dr. John Farrell (Associate Director of Ocean Drilling Programs at JOI since 1997) as the Acting Director until a new permanent director can be hired. The JOI Board of Governors has subsequently examined ODP management procedures within the corporation and instituted and planned a series of changes to ensure continued effective management of the program. It is expected that the status and rationale for these changes will be presented at the EXCOM meeting.

Because of the above mentioned personnel changes, JOI (with NSF concurrence) has had to postpone completion of the revised ODP policy manual and a detailed report on dry-dock activities. NSF is working with JOI staff to ensure early completion of these documents. All other contracting activity and requirements are progressing in a timely and satisfactory manner.

NSF REPORT

ODP COUNCIL

There have been no meetings of the ODP Council since Sydney in July 1999. The Council will meet on Thursday following conclusion of the EXCOM meeting. The status of ODP membership (countries and consortia) is discussed above in the **ODP** report. Neither PACRIM nor ESF Consortia have been able to return to full ODP membership, though ESF has taken a significant step with the addition of Ireland as a new consortia member. The Council will receive a report from EXCOM on the status of these members and additional steps being taken toward full membership. Additional Agenda items include discussion of ODP phase-out planning, recommendations from the fifth Performance Evaluation Committee, and the status of IODP planning.

INTERNATIONAL WORKING GROUP (IWG) FOR IODP

The IWG last met in Washington, DC on 17 February. Two action items were agreed to at the meeting. The first is an IWG review of the IPSC plan for the IODP. The review is to be completed between 1 October and 31 December 2000 and will be presented to the IWG in January 2001. IWG members were requested to submit names of potential committee members to the IWG co-chairs. IWG members were also requested to prepare (and submit to the co-chairs) plans and timelines for obtaining programmatic and financial support for their participation in IODP. Additional discussion items can be found in the meeting executive summary, which should be available on the IODP web page, www.iodp.org, by the time of the EXCOM meeting. The next meeting of the IWG will be in Tokyo on 30-31 August, with the following meeting scheduled for the United Kingdom in mid January 2001.

5. COUNTRY REPORTS

5.1 ECOD

MANAGEMENT MATTERS

1. EMCO meetings

a.) The 16th ECOD Management Committee (EMCO) meeting was held in Madrid, Spain, on 12 May 2000. The 17th meeting of EMCO will be held in Venice, Italy, on 6 April 2001. It would be a joint meeting with the ECOD Scientific Committee (ESCO).

2. ECOD Membership Status

Ireland has now officially joined ECOD by signing an agreement with ESF concerning their membership. ECOD will therefore contribute 99.1% of a full membership to ODP for the US fiscal year 2000 and 99.5% for the US fiscal year 2001.

RELEVANT MATTERS to IODP

1. ECOD "letters of intent" status

A joint letter of intent for IODP was sent from ESF to the IWG on 14 February 2000 on behalf of all member countries of ECOD. Individual letters of intent to the IWG had also sent by Belgium, Spain, and Sweden. ECOD has one formal representative on the IWG, but observers from all member countries are invited to attend the IWG meetings.

2. Other activities and initiatives

a.) The European Science and Technology Advisory Group on Ocean Drilling / European Standing Committee on Ocean Drilling (ESTAG/ ESCOD) met on 10 April 2000 in La Grande Motte en Petite Camargue, France, at times of the 3rd European ODP Forum. On the basis of the workshop on IODP held at the ESF on 27 January 2000, plans were made at that meeting for on going actions to define the various elements of the process for a Joint European Ocean Drilling Initiative. Contributions from industry representatives (ELF-Aquitaine, Shell) indicate a particular interest in collaborating in Europe. As a first step for developing this European process, core members -EU EXCOM and SCICOM members- of ESTAG / ESCOD will meet at BGS Keyworth (UK) on 7 June 2000. This meeting should bring up with a proposal for funding for a European Ocean Drilling Technology Coordinator to be submitted to the European Commission, since an industry link might also increase possibilities to obtain EC funding.

b.) The ESF Standing Committee for the Life and Environmental Sciences (LESC), at their plenary meeting in April 2000, discussed IODP and agreed to provide funding for 2 related workshops in 2000. One of these would be a science meeting and a second meeting could then be held between scientists and high-level EU country managers.

SCIENTIFIC MATTERS

1. Meetings / news

a.) The 30th ECOD Scientific Committee (ESCO) meeting was held on 9 April 2000 in conjunction with the 3rd European ODP-Forum). The next ESCO meeting will be held in Stockholm (Sweden) on 27 October 2000.

b.) The European ODP Workshop (the 3rd European ODP-Forum) was held 10-11 April 2000, in La Grande Motte en Petite Camargue (France), hosted by ODP France. A total of 137 participants were registered for this meeting, and 34 of them came from ECOD (i.e., 25% of the participants).

c.) ESCO has offered to host the next European ODP Workshop (the 4th European ODP-Forum), that tentatively will be held in mid 2002.

d.) Flavio Anselmetti organized the SSP meeting in Zurich, Switzerland, 23-25 February 2000. Martin Hovland hosted the first Arctic PPG meeting in Stavanger, Norway, on 9-10 March 2000.

2. ECOD scientists sailing now/and from January 2000

- Leg 187 (Nov 99-Jan 00): Ingunn Thorseth, Norway (petrologist); Kristine Lysnes, Norway (microbiologist); Massimo D'Antonio, Italy declined a late invitation.
- Leg 188 (Jan-Mar 00): Carl Fredrik Forsberg, Norway (PP specialist); Michele Rebesco, Italy (sedimentologist); Kari Strand, Finland (sedimentologist).

- Leg 189 (Mar-May 00): Caroline Pellaton, Switzerland (sedimentologist); Hendrik Brinkhuis, the Netherlands (palynologist); Marianne Grauert, Denmark (sedimentologist).
- Leg 190 (May-Jul 00): Mario Sánchez-Gómez, Spain (structural geologist).

3. ECOD scientists invited to sail

- Leg 191 (Jul-Sep 00): Rikke Öhlenschläger Pedersen, Denmark (paleontologist) will most probably become invited.
- Leg 192 (Sep-Nov 00): Peter Riisager, Denmark (paleomagnetist); Dominique Weis, Belguim (petrologist).

4. ECOD co-chief invited for upcoming Legs

- Leg 193 (Nov 00-Jan 01): Fernando Barriga, Portugal.
- Leg 194 (Jan-Mar 01): Flavio Anselmetti, Switzerland.

5. ECOD Student Trainees, participation and applications

No student trainees from ECOD have participated on ODP legs since Leg 183. Five student applications have been received at the ESCO Secretariat from Legs 188 to 193, after the student trainee system was started.

5.2 FRANCE

The French Country Report is not available at present. An oral report will be presented at the EXCOM Meeting.

5.3 GERMANY

The German ODP community endorsed the 2nd draft of the IODP Initial Science Plan during their annual meeting in Jena (23-25 February 2000). The German ODP community as well as funding agencies feel that the IODP Science Plan follows closely the recommendations of CONCORD and COMPLEX and reflects the science which is of particular interest to the German geoscientific community in general, and to the ocean drilling community in particular. The report of the Jena Meeting (in German) is available through DFG.

The German ocean drilling community continues to support a close cooperation within the European ocean drilling communities and has participated with 25 scientists in the Ocean Drilling EuroForum which took place 10-11 April 2000 in La Grande Motte near Montpellier (France), where beside science, steps for a common European approach to future ocean drilling were discussed. ODP Germany will actively participate in the planning effort towards a significant European contribution to IODP by the Joint European Ocean Drilling Initiative

established in January 2000 during an ESF sponsored workshop in Strasbourg, France.

Dr. Herman-Rudolf Kudrass, Head of "Marine Geology, Deep-Sea Mining" of BGR has taken over the co-ordination of the DFG Priority Program "ODP/DSDP" from Helmut Beiersdorf. Kudrass has served the drilling programme as member of the JOIDES Planning Committee and Western Pacific Panel. Beiersdorf will continue to represent ODP Germany in the JOIDES Executive Committee.

ODP Proposal 577, "Demerara Rise" (J. Erbacher, R. Norris, P. Wilson) was refined by reprocessing of industry reflection seismic data from Shell at BGR.

Three RV Meteor cruises are scheduled for Autumn 2000 to Spring 2001 to conduct geophysical survey work for the following ODP Proposals:

ODP Proposal 559, "Walvis Ridge" (J. Zachos et al.), off Namibia,
ODP Proposal 556, "Brazil-Falkland Confluence Paleoceanography" (G. Wefer et al.), off Argentina,
ODP Proposal 577, "Demerara Rise" (J. Erbacher, R. Norris, P. Wilson), off Suriname.

The seismic investigations will be carried out by the University of Bremen (P.I.: V. Spiess).

One of the results of the German "ODP Industrieforum" held in Hannover (18 November 1999) is an initiative of German oil and gas industry representatives and PPSP members D. Strack and D. Horn. These colleagues offered their active help in providing ODP leg proponents with industry data, information of concession areas and potential safety problems.

Seventy-one research proposals in support of ODP were submitted to DFG and reviewed. Approximately 80 % were endorsed by the DFG review committee and proposed for funding. Additional 10 % will be reconsidered.

For further German ODP involvement see also http://www.bgr.de/odp (in German).

5.4 JAPAN

Site Survey and Follow-up Cruises

R/V Tansei-Maru:
March 7-14: Kuroshio Transition (Paleoceanography)
May 25-June 2: Nankai Trough (Heat Flow)

R/V Boseimaru:

June 4-10: Nankai Trough (Heat Flow)

Shinkai 6500:
Oct 19-Nov. 11: Nankai Trough (Leg 190 Transect)

R/V Hakuho-Maru:
Nov. 21-Feb. 8: Indian Ocean (Bengal Fan and Gulf of Aden)

Symposium and Workshop

March 8-9: Seismogenic Zone (JAMSTEC)
March 17: Seismogenic Zone (ORI)
March 19: Evolution of Accretionary Prism, Geological Society of Japan (Tsukuba)
June 26: Western Pacific Geophysical Meeting: IODP Town Meeting

New Panel Members

SCICOM: Hidekazu Tokuyama (ORI) and Masao Nakanishi (alt: ORI)
i-SSEP: Teruaki Ishii (ORI)
e-SSEP: Hirotaka Matsuda (Kumamoto Univ.)

IODP Related Activity

June 6: IODP National Committee Meeting

5.5 PACRIM

The **Australian** ODP is struggling with the downward spiral of the Australian dollar. The year 2000 contribution from the ARC was $990,000 (this was $26,131 less than requested). In addition, funds were awarded based on an exchange rate of $1AUS= $0.65 US – the exchange rate is currently $0.58 US. The Australian Secretariat is at present finalising our grant application for 2001.

As part of the Australian plan for continued participation in ODP a one-day workshop is being held to coincide with the Australian Geological Convention (in Sydney from 3-7 July 2000). Dr Jamie Austin will be representing IPSC at the workshop.

As tenure for the Secretariat office at the University of Sydney ends early next year, the Australian ODP Council has called for applications from 19 Australian University Geoscience Departments to house the office. The office tenure is from 1 April 2001 until the end of the current program- 30 September 2003. Applications closed on 7 May 2000.

The *JOIDES Resolution* has berthed in Australia twice so far this year. At the Hobart port call in March a reception was held at the CSIRO for the visiting scientists and members of the local science community. The following night a

reception for the scientists was given at Government House, hosted by the Governor of Tasmania. During the stay in Hobart approximately 500 school and university students toured the ship. More recently, the ship stoped in Sydney for 1 day (May 6th). A press conference was held on board to publicise the results of Leg 189 and approximately 50 university students toured the ship.

As the ship schedule moves away from Australian waters we have had a decrease in the number of scientists applying to sail on future cruises. Australia has had 7 official shipboard participants so far this year (Alex Kaiko was an emergency addition to Leg 188 following the late withdrawal of a German scientist). Of the participants, 3 have sailed as co-chiefs. The Australian Secretariat is in the process of encouraging people to apply for Legs 195 and beyond.

Australian Participants in 2000

Phil O'Brien	AGSO	188	2000	Co-chief scientist
Patrick Quilty	University of Tasmania	188	2000	Micro-paleontologist
Alex Kaiko	Curtin University	188	2000	Res. Fellow Sedimentologist
Neville Exon	AGSO	189	2000	Co-chief scientist
George Chaproniere	AGSO	189	2000	Micro-Paleontologist
Peter Hill	AGSO	189	2000	Physical Properties
Chris Ferguson	University of Wollongong	190	2000	Sedimentologist, Tectonics
Ray Binns	CSIRO	193	2001	Co-chief scientist

The **Canadian** Council Chair and Secretariat have spent considerable time attempting to head off or remedy an anticipated funding shortfall for FY2001 that would leave the Canadian contribution at <1/3. Approaches have been made to two federal government departments, and letters written or copied to various officials from members of parliament to the Canadian ambassador to the U.S. At the time this document is being written, no additional funds have been identified to help Canada guarantee its 1/3 membership in PacRim. A possible solution might entail the addition of an additional partner to PacRim. **India** has now been approached by PacRim with an invitation to join the consortium at a 1/6 level. This invitation was delayed because of uncertainties caused by personnel changes at JOI.

An ODP Special Session (talks and posters) was held at the GeoCanada2000 meeting in late May in Calgary. In the fall, a scientific planning meeting will be held in Calgary to develop strategies and proposals for Canadian IODP participation, including the concept of drilling on the continental margin of eastern Canada with in-kind and other support from petroleum exploration companies. Canada will be hosting the Arctic PPG in Calgary June 26-27 and Dalhousie University (Halifax) will be hosting the OPCOM/SCICOM meeting in August.

From **Chinese-Taipei**, Dr. Wen-Tsong Liang participated in ODP Leg 187. A new mini-leg drilling proposal was submitted to the JOIDES office in March 2000 to

study the Pleistocene Kuroshio paleoceanography. This proposal (ODP Proposal 583) intends to drill at a single site in the Southern Okinawa Trough with a minimum drilling time (e.g. 3 days) during transit of the JOIDES Resolution from Kaohsiung, Taiwan, to the Nankai Trough (Leg 196).

The Chinese-Taipei ODP Consortium Annual Meeting was held on 15 April 2000, at the National Taiwan University, Taipei. A major structural change of the Consortium organization was approved during the meeting. The re-organization was aimed to facilitate the actual ODP related research activities in Taiwan. The Chairman and Director of the Secretariat of the Consortium are still held by Drs. Kuo-Yen Wei and Char-Shine Liu, respectively. However, the original panels were replaced by working groups. The four working groups that have been established are:

1. Active Tectonics Research Group, chaired by Dr. Chao-Shing Lee,
2. Western Pacific Paleoceanography Research Group, chaired by Dr. Min-Te Chen,
3. Post-cruise Research Group, chaired by Dr. Hui-Lin Lin, and
4. Theme Study Research Group, chaired by Dr. Ju-Chin Chen.

An *ad hoc* committee has been established to organize the activities for the *JOIDES Resolution*'s first port call to Taiwan in mid-April 2001. The first committee meeting was held on 3 May 2000 at the National Sun-Yet Sun University in Kaohsiung. A workshop on ODP deep biosphere studies will be held in late May at the National Taiwan Ocean University, Keelung.

KoreaODP SciCom activities: (1) Task Force Team for writing a proposal for drilling around the Korean continental margin was organized in February; cooperation with Japanese and PacRim scientists will be sought; (2) SciCom decided to receive proposals related to drilling the Korean continental shelf until the end of this year.

KoreaODP Secretary activities: (1) Database for Korean geoscientists is completed, and will be connected to KODP homepage in near future; (2) KODP has continued to seek more funds to be a 1/6 member, and is currently preparing a proposal to submit to MOST (Ministry of Science and Technology); (3) KODP newsletter will be issued soon to advertise KODP activities and encourage Korean geoscientists to participate in ODP.

5.6 THE PEOPLE'S REPUBLIC OF CHINA

ODP LEG 184: POST-CRUISE STUDIES

Over the past months, the ODP-related activities in China have been focused on post-cruise studies of Leg 184 to the South China Sea. Because of the paleoceanographic nature of the cruise, a large amount of laboratory analyses has been planned. Nearly 50 scientists and postgraduate students are involved in laboratory analyses of sediment cores taken from the Dongsha and Nansha deep-

sea areas. Within the framework of a major research project "History of East Asian Monsoon in Marine Records" supported by the National Natural Science Foundation of China, ten laboratories from five cities (Shanghai, Beijing, Guangzhou, Nanjing and Qingdao) are analyzing various aspects of sediments from the South China Sea, including isotopic, organic and inorganic geochemistry and ten groups of microfossils.

As demonstrated by the recent annual reviewing meeting in Shanghai (May 14-16), the first-year post-cruise studies have yielded very encouraging results. A total of 16,945 samples were taken from Leg 184 cores for 22 items of analyses, on request by 12 ship-board and shore-based researchers in China. In practice, this means as many as 43,262 analyses in labs. Many labs are working day and night, and up to early May, 22,883 analyses have been completed. On the basis of over 2300 analyses of foraminiferal tests, Site 1148 has provided the first isotope curves in the China Seas covering the last 23 million years. In combination with biostratigraphic data from four groups (foraminifers, nannofossils, radiolarians and diatoms), this will be one of the best late Cenozoic stratigraphic sequences in the western Pacific. Another example is Site 1144 with the highest sedimentation rates of well preserved deep-sea deposits in the region (about 500m for the last million years), 640 samples of pollen analyses have revealed climatic and vegetational cyclic fluctuations over the last 0.5-0.6 million years.

In sum, our preliminary results from the first-year post-cruise studies have contributed to the following fields:

--- Stratigraphy: The first late Cenozoic deep-sea sequence and the high-resolution Pleistocene sequence as described above;

--- Tectonics: Sedimentary evidence for the sea-floor spreading and the following tectonic events in the South China Sea;

--- Sedimentology: Radical changes in provenance of sediments, diagenesis of biogenic material;

--- Paleoclimate: Climate and vegetation cycles mentioned above, drastic changes around 8 Ma, 0.9 Ma ("Mid-Pleistocene Revolution"), and around 0.15 Ma;

--- Abrupt events: The microtektite event at 0.8 Ma, Toba volcanic eruption at 0.07 Ma, etc.

TOWARDS THE NEW-CENTURY OCEAN DRILLING

China is currently working out its development plan for the tenth five-years (2001-2005) and for the early 21 century, marine science including ocean drilling is one of priorities in basic researches.

Over the past year, China has been actively participating in ODP-related meetings. We are expecting further close cooperation with the ODP community. Thus, next March, the JOIDES SciCom will have its meeting in Shanghai, where ODP-China will organize the Third National ODP Symposium at the same time. The Post-Cruise Scientific Meeting of ODP Leg 184 will take place in Beijing, from May 7 to 11, 2001, jointly with SCOR/IMAGES Working Group on Asian Monsoon Evolution (SEAMONS). The JOIDES Site Survey Panel will also have its session in China.

5.7 UK

The UK Country Report is not available at present. An oral report will be presented at the EXCOM Meeting.

5.8 USA

U.S. COUNTRY REPORT (PART 1, NSF)

The final resolution of the NSF FY 2000 budget saw an increase for the agency of slightly more than 6%, with the Division of Ocean Sciences increasing approximately 3%, and the overall Ocean Drilling Program activity up by 2.5% from 1999 levels. The ODP increase is targeted primarily for U.S. science activity in the ODP. The FY 2001 budget presently being considered by Congress identifies a total NSF increase of approximately 17% above FY2000, with an increase of over 22% in the Division of Ocean Sciences and 15% in the Ocean Drilling Program. A significant fraction of the overall NSF increase is related to three primary Foundation initiatives: Biocomplexity, Information Technology Research, and Nanoscale Science and Engineering. Although the requested budget increase has apparently received strong bipartisan support, overall FY 2001 budget constraints and potential impacts of Fall elections are likely to result in a much smaller increase than requested. Proposed ODP increases in 2001 are again targeted on U.S. scientific participation in the ODP, especially research related to Foundation and Division programs in biocomplexity, global change, and MARGINS, a cooperative initiative with the Division of Earth Sciences at NSF.

Focused NSF funding in support of ODP science is divided between the U. S. Science Support Program (USSSP) administered via cooperative agreement with JOI ($6.4M in FY 2000), and a separate unsolicited proposal/grant activity administered at NSF ($9M in FY 2000). A discussion of recent activity of the USSSP can be found in a separate attached report from JOI.

Field programs supported by NSF in calendar year 2000 were reported to EXCOM at the February meeting. All panels have now been completed for review of proposed field projects for calendar year 2001, the last year in which data collected are likely to have a significant impact on JOIDES review of drilling proposals for the remainder of the ODP. For 2001 NSF/ODP has tentatively committed to support of: (1) An MCS and OBS study of rifting processes in the Gulf of Aden under the direction of Neil Driscoll (Woods Hole), John Diebold (Lamont) and Brian Taylor (Hawaii); (2) an MCS study of megamullions on the Mid Atlantic Ridge by Brian Tucholke (Woods Hole); (3) a heat flow study of the eastern Cocos plate under the direction of Andy Fisher of the University of California at Santa Cruz; (4) a study of the geochemistry and structure of serpentinite diapirs in the Marianas forearc under the direction of Patty Fryer of the University of Hawaii; (5) a seismic study of gas hydrates on the Oregon margin by Ingo Pecher (University

of Texas); and (6) construction and installation of instrumentation in the corks to be deployed at Nankai under the direction of Keir Becker, University of Miami. Additional proposals are still being evaluated in light of budget constraints and review comments. Beyond 2001, NSF funding will begin to focus on research and data acquisition required for preparation of drilling proposals for the IODP.

With respect to NSF/ODP personnel, Dr. Jamie Allan has announced his departure from the position of visiting scientist. Jamie was on loan to us from Texas A&M, and in July will move to the position of Chair, Department of Geology at Appalachian State University in North Carolina. In his 2 1/2 years at NSF, he has demonstrated a deep commitment to marine geosciences and the Ocean Drilling Program. His energy and efforts on behalf of the Program and the community are deeply appreciated and he will be missed. The vacant position has been announced and we hope to fill it as soon as possible.

U.S. COUNTRY REPORT (Part II, JOI/USSSP Activities 2/00 to 6/00)

JOI/USSSP FY16 Program Plan approved: NSF approved the final version of the Year 16 Program Plan for the JOI/USSSP in February for the contract year beginning 1 March 2000. The final approved budget was $6.1M. A "close-out" report for the prior Year 15 will be submitted to NSF in June.

IWG Support Office: Since 30 November 1999, the IWG Support Office has assisted the International Working Group (IWG) and its designates in their efforts to build a new post-2003 drilling program, the Integrated Ocean Drilling Program (IODP).

To date the IWG Support Office has developed an annual work plan, assisted in planning the February IWG meeting, provided support for the May IODP Planning Subcommittee (IPSC) meeting, coordinated the distribution of the draft IODP Initial Science Plan to reviewers. They have also established an e-mail address (iwgso@brook.edu) and an IODP web site (http://www.iodp.org). The IWG Support Office is now completing an introductory IODP brochure that should be available in English in June. The office plans to update this brochure and produce it in other languages in the future. Staff members are planning to attend professional meetings (e.g., the Spring American Geophysical Union Meeting in Washington, DC) to promote IODP.

The IWG Support Office also welcomed a new employee this spring. On 20 March 2000, Trish Kellermann was hired as the Administrative Assistant. The Office is now fully staffed with representatives from the United States and Japan, an office manager, administrative assistant and other part-time staff for travel and logistics, contracts, purchasing, and technical needs.

For general inquiries or to request IODP brochures, please contact Jennifer Peterson, IWGSO Office Manager at:

IWG Support Office, Suite 700
1755 Massachusetts Avenue, NW
Washington, DC 20036-2102
http://www.iodp.org
iwgso@brook.edu
Phone: 202 232 2900 x262
Fax: 202 232 3426

Support for US participation in IODP planning activities (e.g., IPSC): JOI/USSSP funds are being used to support Dr. Ted Moore, the Chair of the IODP Planning SubCommittee (of SCICOM, thus IPSC), and his assistant Ms. JoAnne Reuss. Additional funds are being used to support US participation in IPSC meetings, IPSC Working Group meetings, and for other long-term planning activities.

USSAC subcommittee, "Conceptual Design Committee": The final report of the Conceptual Design Committee (CDC), titled "The Non-Riser Drilling Vessel for the Integrated Ocean Drilling Program: A Report from the Conceptual Design Committee - Performance Specifications, On Board Scientific Measurement Capabilities, and Survey of Drilling Vessels", was delivered to NSF in March 2000. The United States Science Advisory Committee (USSAC) initiated this activity and distributed the report over the JOI/USSAC listserver. The CDC report is also available electronically at http://www.joi-odp.org/USSSP/cdc/default.html and as a downloadable PDF file at http://www.joi-odp.org/USSSP/cdc/cdcreportfinal.pdf.

IPSC has developed a questionnaire that seeks specific comments from the international community regarding the recommendations made in the CDC Report. The questionnaire (Word version) is available at http://www.joi-odp.org/USSSP/cdc/default.html. By clicking on the words "this questionnaire", you will be able to download the file (cdc_questionaire.rtf). Please use this form to return your comments about the CDC Report to IPSC by email: ipsc@umich.edu.

USSAC membership: Nick Christie-Blick resigned membership in USSAC in March 2000. The following members are slated to rotate off USSAC on 30 September 2000: Steve Carey, Rick Murray, David Naar, and Lisa Tauxe. New members will be selected, and approved by the JOI Board of Governors in September.

Site Augmentation Proposals Funded: Richard Norris (Woods Hole Oceanographic Institution), "Multi-channel Seismic Reflection Profiling and Swath Bathymetry on Demerara Rise, Western Equatorial Atlantic", (pending ship-time request/authorization to NSF).

JOI/USSSP Workshop Proposals Funded: A workshop entitled "GeoFluids of Overpressured Strata in the Gulf of Mexico", co-sponsored by JOI/USSSP and Conoco, was held on 3 March 2000 at the Airport Marriott Hotel in Houston, Texas. Drs. Peter Flemings (Penn State) and Alan Huffman (Conoco) were the co-

conveners of this workshop. More information about the workshop appears at http://hydro.geosc.psu.edu/Odp/odp.html.

Terrence Quinn (University of South Florida), "An International Workshop on Submerged Coral Drilling" (tentatively scheduled for September 2000 and co-funded by the US NSF Earth System History initiative). The webpage for this workshop is http://www.marine.usf.edu/coraldrilling/index.html.

Post-Cruise Scientific Research Proposals: From 16 January to 31 May 2000, 10 post-cruise scientific research proposals were formally approved for funding by JOI as part of the US Science Support Program. The lower than normal number of awards is linked to the hiatus in drilling associated with last fall's dry dock modifications to the *JOIDES Resolution*.

Schlanger Ocean Drilling Fellowship Program: Two one-year, shore-based fellowships were awarded in January 2000. The recipients were Joan Steurer, University of Missouri, Columbia, for "Composition, intrinsic shear strength, physical properties, and texture of sediment at the Nankai Trough, Leg 190: An integrated approach" and Aradna Tripati, University of California, Santa Cruz, for "Tropical sea surface temperature reconstruction for the early Paleogene using Mg/Ca ratios of planktic foraminifera: ODP Leg 143, DSDP Legs 22 and 86."

ODP Undergraduate Student Trainee Program: JOI/USSSP will fund the travel and pre-cruise physical exam expenses of Lindsay Smith, from Rice University, to enable her to sail on Leg 191 as a US participant in the ODP Undergraduate Student Trainee Program. Under the mentorship of Dr. William Sager, a Leg 191 co-chief, Ms. Smith will conduct paleomagnetic measurements on basalt samples to calculate a paleolatitude for the drill site.

JOI Intern: As reported in the February 2000 EXCOM Country Report, JOI's first intern, Ms. Alexandra Williamson, worked at JOI from September through December 1999. During that time, she constructed a detailed electronic bibliographic database, with key words, of all papers published in *Science*, *Nature*, *Geology* and *Paleooceanography*, related to DSDP and ODP on a primary, secondary, and tertiary basis. She then grouped these publications and related them to the themes of the 1996 ODP Long Range Plan.

JOI's next intern, Ms. Elizabeth (Betsy) Fish, will continue Ms. Williamson's work on the legacy project, as well as assisting with other JOI/USSSP administrative duties. The term of Ms. Fish's internship is 6 months, beginning 12 June and ending 15 December 2000. Ms. Fish graduated from Franklin and Marshall College in May 2000 with a B.A. in geosciences. She has a strong interest in ODP and plans to pursue a graduate degree in geoscience or science management. Her science background and previous office experience in the Physics Department at Franklin Marshall College make her ideally suited to the USSSP intern project.

The purpose of this project is to assemble and assess the scientific "legacy" of the program, as represented by a subset of scientific literature. Ultimately, a summary document of the scientific engineering and technological accomplishments of the

ODP will be created. The audience for this document will be similar to the one targeted by the "ODP Greatest Hits" volume, which includes a broad cross-section of readers including the general public, scientists, journalists, and funding agency representatives.

JOI/USSAC Newsletter: A 24-page spring issue of the newsletter was published and distributed in May 2000. It can be viewed on-line, along with past newsletters, at http://www.joi-odp.org/USSSP. The primary focus of this issue was to update the community on the planning process for post-2003 scientific ocean drilling. Work is in progress on the summer issue of the newsletter. The mailing list for the newsletter includes 2058 scientists in the US and 349 scientists in other countries. An electronic list to serve as a community forum and to distribute late-breaking news has been recently inaugurated.

Gateways to Glaciation CD: This multimedia, educational CD project is nearing completion. The beta version of the CD was tested by JOI staff in February, and while most of the major problems were resolved, the issue of cross platform (Macintosh and Windows) compatibility persists. The contractor responsible for programming the CD is working to resolve this problem, and should provide a gamma version of the CD for review in early June. If all problems have been resolved, the CD will be duplicated and will be ready for distribution upon request from JOI in late June. This CD allows students to perform experiments similar to those done on an ODP cruise. The focus of this CD is the hypothesis that the closing of the isthmus of Panama triggered the onset of significant northern hemisphere glaciation during the Pliocene.

JOI/USSAC Sponsored Booth at ASM Meeting: JOI/USSSP organized an "ODP booth" at the American Society for Microbiologists (ASM) meeting to highlight ODP contributions to understanding the "Deep Biosphere" and future plans for microbiology research on the *JOIDES Resolution*. The booth was staffed for the duration of the meeting to provide explanations of ODP and lab facilities on the JR, future plans for scientific ocean drilling, and opportunities for microbiologists to participate in ODP. In conjunction with this meeting, an interview about ODP microbiology activities was conducted with Dr. Tommy Phelps (USSAC member). This interview was aired on Los Angeles radio station KNX during the "Tech Hour" programming.

AGU meetings: USSSP will co-sponsor booths at both the Spring and Fall meetings of the American Geophysical Union. Another ODP "Town Meeting" will also be scheduled for the Fall meeting.

JOI/USSAC Distinguished Lecturers Series for 2000-2001: The lecturers and the venues for their talks over the coming academic year have been identified. JOI is now working with the speakers and the respective institutions to determine the dates of the individual lectures.

Dr. Timothy Bralower, University of North Carolina:
"It was the Best of Times, It was the Worst of Times": Biotic Consequences of the Late Paleocene Thermal Maximum.
Boston College - Boston, MA
Florida International University - Miami, FL
Western Washington University - Bellingham, WA
Brigham Young University - Provo, UT
Elizabeth City State University - Elizabeth City, NC

Dr. Eugene Domack, Hamilton College:
Late Quaternary Sedimentation in Antarctica's Palmer Deep.
Northern Illinois University - DeKalb, IL
Rice University - Houston, TX
University of Alaska - Fairbanks, AK
Northwest Missouri State University - Maryville, MO
Scripps Institution of Oceanography - La Jolla, CA

Dr. Martin Fisk, Oregon State University:
Microbes Beneath the Ocean Floor and the Possibility of Extraterrestrial Life.
Iowa State University - Ames, IA
Five Colleges Coastal and Marine Sciences Program - Northampton, MA
Muskingum College - New Concord, OH
Louisiana State University - Baton Rouge, LA
Vassar College - Poughkeepsie, NY

Dr. Garry Karner, Lamont-Doherty Earth Observatory:
The Paradox of Low-Angle Crustal Faulting and Rupturing of Continents.
Michigan State University - East Lansing, MI
New Mexico Tech - Socorro, NM
University of North Dakota - Grand Forks, ND
State University of New York - Binghampton, NY
St. Louis University - St. Louis, MO

Dr. Delia Oppo, Woods Hole Oceanographic Institution:
Millennial Scale Climate Variability in the North Atlantic.
University of South Florida - St. Petersburg, FL
Central Connecticut University - New Britain, CT
Middlebury College - Middlebury, VT
University of Pennsylvania - Philadelphia, PA

Dr. John Tarduno, University of Rochester:
Motion of the Hawaiian Hotspot During Formation of the Emperor Seamounts.
Franklin and Marshall College - Lancaster, PA
University of Akron - Akron, OH
University of Wisconsin, River Falls - River Falls, WI
University of Alaska - Anchorage, AK
Idaho State University - Pocatello, ID

UK country report for EXCOM June 2000

NERC funding of marine earth science

- NERC's Ocean Margin LINK (industry co-funded) Thematic Programme has issued a call for outline proposals and scoping studies; the programme has a total budget of £4.5m. A recent town meeting in London was attended by 150 people from both academia and industry. The Ocean Margins LINK programme will tackle scientific challenges through research projects which seek further understanding through three main themes:
  - Deep structure and rifting processes;
  - Sedimentary processes, sediment movement and slope stability; and
  - Fluid flow particularly into and out of the seabed, including its relationship with and effect on deep-water faunas
- An ODP Special Topic research grant for £32,018 has been awarded to Dr Pamela Kempton (NERC isotope geosciences laboratory, British Geological Survey), to study "Dynamics of a mantle domain boundary: a Hf-Nd isotope study of the Australian-Antarctic Discordance (AAD)".
- Dr Giancarlo Bianchi, University of Cambridge has been awarded the prestigious title of "Rob Kidd memorial fellow" for his work on "Millennial-scale deep ocean circulation changes across the mid-Pleistocene climate transition"

ODP staffing

- Applications for UK places on forthcoming ODP legs have increased significantly over the numbers of applications in recent years, thanks to:
  - Improved targeting of staffing calls
  - Regular email contact between the UK ODP programme manager and the UK community, and an improved UK website.
  - Targeting of ODP information at UK Earth Science Departments with no / little previous ODP involvement to ensure that the maximum number of potential applicants are aware of the opportunities available.

European co-operation and funding

- The HYACE toll for recovery of gas hydrate samples at in-situ pressure and temperature conditions, has been successfully tested in Germany . This is an EU co-funded program with significant UK involvement.
- Work has begun on an International Deep Biosphere research programme which has been awarded €1 million from EU research funds, led by Prof. John Parkes at the University of Bristol.
- Representatives of all current European ODP members have met to discuss further co-operation in future scientific ocean drilling. European funding agencies support a move toward greater European co-operation in ocean drilling.
- Dr Barry Cragg, University of Bristol, is sailing as a microbiologist on leg 190 in a French berth, another step forward in European co-operation in ocean drilling.

Scientific meetings

- The next prestigious "William Smith Lecture" at the Geological Society of London, to take place in March 2001 will be on "Palaeoceanography and Climate Change", to be co-convened by Prof. Harry Elderfield of University of Cambridge and Dr Paul Wilson, University of Southampton.

Dr David Falvey, 9 June 2000.

Fifth Performance Evaluation of the Ocean Drilling Program

Report

and

Response

Joint Oceanographic Institutions Incorporated

Joint Oceanographic Institutions for Deep Earth Sampling

ODP Science Operator, Texas A&M University

ODP Wireline Logging Services, Lamont-Doherty Earth Observatory

JOIDES/ODP Site Survey Data Bank, Lamont-Doherty Earth Observatory

Fifth Performance Evaluation of the Ocean Drilling Program

Report

October 1999

Prepared for:

Joint Oceanographic Institutions, Inc.
1755 Massachusetts Avenue, NW, Suite 800
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Executive Summary

The Ocean Drilling Program in its final phase is, by most measures, an incredibly successful program. However, there are still a number of major issues facing the program during the final Phase III years, primarily related to the lack of funding to complete technological developments and capability upgrades to the vessel in order to complete the goals of the Long Range Plan.

One of the frustrations for an outside group trying to evaluate the success of the Program is that despite many reviews over the years, it is still difficult to obtain a summary of the accomplishments toward the overall goals of the program. The goals are stated in the Long Range Plan, but the summary of the accomplishments for Phase II or the progress on Phase III doesn't appear to exist for each theme or initiative – something that is an EXCOM mandate.

Program management and operations have improved significantly since the PEC-IV report was provided to JOI Inc. in 1995.

The new Advisory Structure implemented in 1998 has generally been well received and has increased the number of individuals and institutions involved in the Ocean Drilling Program. The number of people on Panels has decreased, but overall participation has increased because of the Program Planning Groups and external proposal reviewers.

The main concern of PEC-V is that current plans suggest that the implementation strategy for the Integrated Ocean Drilling Program (IODP) for the Twenty First Century (Phase IV), may result in a gap in drilling operations of as much as two years as Phase III (ODP) ends. The size of the gap will depend on the specific drilling platform requirements of the new program and the ability of the ocean drilling community to implement the current plan at a faster pace.

Also, to continue solely, with the current steady-state program management arrangement that has worked well in the past, could hinder the dynamics of the transition to the IODP.

The results of the evaluation of the Ocean Drilling Program according to the Terms of Reference provided to Performance Evaluation Committee-V by JOI are summarized below. The headings for each section relate to the chapter headings in the Ocean Drilling Program Long Range Plan document.

Implementation Strategy – Phase III (1998-2003)

Phase III achievements and goals

- Deep biosphere program well underway.
- Complete array of extremely high-resolution climate records will complete the first-pass attempt to generate global coverage.
- Hemisphere-based record of ice-sheet growth is unlikely to be achieved.
- Only one leg completed for accurate measurements of bio-geochemical cycling.
- Extreme climate objectives will not be met – Program Planning Group (PPG) established to develop an alternative plan.
- Global carbon cycling program will have completed as many as 3 legs to continue push toward a suite of latitudinal and depth transects.
- Mass balance experiments at convergent margins – one leg completed.
- Offset characterization of lower crust – leg may be scheduled.
- Reaction zones beneath large hydrothermal deposits – one leg scheduled.
- Dynamics of mantle reservoirs – 2 legs scheduled.

The ODP does not have the resources to achieve all of the Phase III goals. Innovative budget strategies focussed on science priorities are essential to the success of Phase III. Proposal pressure is strong in both shallow-water drilling and for lithosphere objectives but budget constraints will force the ODP to look for more outside funding.

Implementation Strategy – Phase IV (post-2003)

- A vision for an Integrated Ocean Drilling Program (IODP) for the 21st century is in place.
- The IODP vision involves multiple drilling platforms.
- The Japanese government has agreed to build a large riser-equipped drilling vessel that will be available for trials in late 2003.
- The question is how and when to implement the vision for the other platforms?
- It appears to PEC-V, given the present state of planning, that IODP could not begin before late 2004. Is this acceptable to the community?
- PEC-V members are concerned that the implications for society, science and existing and potential support operations have not yet been considered in ODP adequately.
- If it is decided that a gap in drilling is unacceptable, then IODP partners must enter a phase of rapid, open communication (including marketing and lobbying) and contract negotiations to ensure a successful transition to the new phase of drilling by the beginning of 2004.

- There must be a clear leadership established to effect this movement into the new phase of drilling. Someone will have to be identified as the intellectual leader with the capability of harnessing the scientific and political powers of the prospective participants in the program.
- The role of ocean drilling in accessing the memory of earth processes provides a baseline for studies of more recent global changes and provides a view of extremes of earth processes which must be incorporated into initiatives to develop new integrated global ocean observation programs.

Program Management and Operations

- Communication and coordination among the prime contractor, subcontractor and the advisory structure appears to have improved during the past year.
- PEC-V believes that ODP-TAMU has become a more efficient and responsive organization during the past two years. In conjunction with a reduction in the number of staff, ODP-TAMU has been able to provide most scientific services to their clients.
- The rate at which project management practices are implemented can be increased.
- ODP-TAMU should look into obtaining ISO9000 certification.
- The JANUS database must now be customized to ensure that customers are able to import and utilize data efficiently in specialized software applications. Migration of existing datasets into JANUS should be completed.
- A commercial "ocean routing" service should be considered to minimize leg transit time. This will ensure that the time on site in each leg is maximized.
- Borehole Research Group – overall, ODP Logging Services have done a good job meeting their contractual responsibilities.
- It appears that the "distributed" or international model for provision of petrophysical services is cost-effective and has been successful.
- Support for the Site Survey Data Bank is adequate for the current system that involves mostly paper records, but is insufficient for developing a system that archives and distributes data in digital formats. Digital data will become vital when dealing with surveys for the new riser vessel.
- The Pressure Core Barrel (PCB) was only partially successful on Leg 164. The European HYACE might not be available in time for the planned gas hydrate legs.
- Detailed lithology-facies interpretations from borehole logging should become a routine operation either on board or within three months of the completion of a leg.

Science Advice and Coordination

- The new advisory structure is in place and is becoming increasingly efficient and effective as each issue is dealt with by JOI, the JOIDES office and the advisory structure.
- Initial problems associated with the transition to the new structure are now mostly solved.
- Participation by individuals and institutions in the advisory structure of the program has increased.
- The initiative by the SCICOM Chair to ensure that OPCOM meets during the SCICOM meeting should resolve some scheduling problems that occurred during the transition phase.
- The Scientific Measurements Panel seems to be unable to address major issues because of the scarcity of expertise required to debate and answer ODP operations questions. Greater flexibility is required to ensure that an adequate number of experts are available to properly debate and solve issues.
- Partnerships are working well in terms of major science initiatives. ODP is drilling scientific targets that meet both ODP and other Program objectives.
- Partnerships with industry have not yet been developed as well as they could. ODP has two projects: with JAMSTEC for the development of the Advanced Diamond Core Barrel and with HYACE on a new gas hydrate tool. ODP has started a small, but important partnership with DOE on gas hydrate research. More partnerships will be required to ensure that scientific objectives are met.

PEC-V Terms of Reference

Terms of Reference for the evaluation will embody the following general procedures and criteria:

- The committee membership will consist of international experts in the fields of science, engineering and management to be appointed by the President of JOI in consultation with NSF, the JOI Board of Governors, and JOIDES. The committee should be chaired by an eminent scientist, who should be knowledgeable about ODP, but not currently active in the program.

- The committee is charged with addressing the following specific issues, as well as other items considered important by the committee:

- The progress of the Program toward the achievement of the major scientific goals outlined in the ODP Long Range Plan, and the cost effectiveness and performance of JOI, and its major subcontractors, in achieving these goals. **This progress should be evaluated within the context of the budgets available to the drilling program.**

- The effectiveness of mechanisms in place for making budgetary decisions in the context of the scientific priorities of the Program and projected budgetary constraints, and the potential of current strategies for seeking additional avenues of funding for the Program.

- The operation of the new JOIDES advisory structure, including proposal evaluation and selection, short- and long-term planning, and provision of technical advice to JOI and its subcontractors.

- The progress of the present Program in preparing for a new scientific ocean drilling program beyond the year 2003.

PEC-V Committee Members

Dr. Noriyuki Nasu (Chair)
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University of Tokyo
Japan

Dr. Tom Loutit (Vice-Chair)
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Mr. Earl Doyle
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Stanford University
Stanford, CA

Dr. Karl Turekian
Benjamin Silliman Professor of Geology and Geophysics and
Director, Yale Institute for Biospheric Studies
Yale University
New Haven, CT

Introduction

The report is presented in three sections that relate directly to the structure of the ODP Long Range Plan. The first section discusses the success/failures of the Implementation Strategy for the Long Range Plan for both Phase III (1998-2003) and Phase IV (post-2003). The second section looks at the efficiency and effectiveness of Program Management and Operations and related issues and the third evaluates Science Advice and Coordination with specific reference to the new Advisory Structure.

The committee gathered the information base for the evaluation during a series of visits to ODP institutions and panels including a visit to the COMPLEX meeting in Vancouver in May 1999. Sets of questions were prepared for each part of the ODP, including the COMPLEX attendees, and the answers were evaluated by the committee. Only the observations and recommendations of the committee are published in this report.

Visit Schedule

Date	Location
16-17 March	JOI Headquarters, Washington, DC Members present: Nasu, Loutit, Doyle, Duerbaum, Karig, Turekian
18-19 May	ODP-TAMU Headquarters, College Station, TX Members present: Nasu, Loutit, Doyle, Duerbaum, Karig, Nur, Turekian
23-25 May	Science Steering and Evaluation Panel Meetings (SSEPs), Seattle, WA Members present: Nasu, Loutit, Duerbaum, Karig, Nur
26-29 May	Conference on Multi-Platform Exploration (COMPLEX), Vancouver, BC Members present: Nasu, Loutit, Duerbaum, Karig, Nur
30 May	PEC-V Meeting in Vancouver, BC Members present: Nasu, Loutit, Doyle, Duerbaum, Nur
4 June	Logging Services Headquarters, Lamont-Doherty Earth Observatory Members present: Nur, Turekian
14 June	JOIDES Office, Kiel, Germany Member present: Duerbaum
12-14 July	JOI Headquarters, Washington, DC Members present: Nasu, Loutit, Doyle, Duerbaum, Karig, Nur, Turekian

Implementation Strategy

Phase III–Implementation Strategy

Introduction

PEC-V members asked a number of questions to understand the status of the Phase III program as outlined in the Long Range Plan (LRP) document.

General questions

- *Is the ODP on track to achieve its goals?*
- *Does the ODP have the resources to achieve its goals?*
- *Were the goals of Phase II achieved?*
- *Illustrate progress toward Phase III goals.*
- *Has the Management Improvement Plan (MIP) been successful?*
- *Is Project Management (PM) in place throughout the Ocean Drilling Program?*
- *Were the enhancements to program operations (outlined on page 72 of the LRP) completed?*

Summary

- ODP is on track to achieve most, but not all of its goals of Phase III.
- Technology or capability constraints will limit the achievements.
- "Flat" budgets have exerted a strong influence on the success of Phase III.
- The goals of the Earth's Interior community are unlikely to be realized.
- Innovative solutions to technological problems are difficult when funding is low.
- The ODP does not have the resources to achieve all of the Phase III goals.
- Innovative budget strategies are essential to the success of Phase III.

Achievements

As of July 1999, ODP is ten months into the five-year plan for Phase III.

This year is the first fully operational year that addresses scientific challenges outlined in the 1996 Long Range Plan. The areas of emphasis, and the initial scientific expeditions and operational activities that address these areas are:

- Expanding the global array of extremely high-resolution records of climate change.

  - **Leg 184, South China Sea.** February - April, 1999. This basin has not previously been cored by DSDP or by ODP. Excellent quality late Neogene cores were recovered and will enable detailed reconstruction of the evolution of the southeast Asian monsoon climate regime.

- **Pacific Paleoceanography.** Two legs (Southeast Pacific Paleoceanographic Depth Transects (proposal 465), and A Paleogene South Pacific APC Transect: Heat Transport and Water Column Structure during an Extreme Warm Climate (proposal 567) will be drilled in 2001 to address this topic.

- Establishing a hemisphere-by-hemisphere detailed history of ice sheet growth, distribution and decay.

  - **Leg 188, Prydz Bay.** January 2000. Dating the initiation of Antarctic glaciation, its evolution, and the link to Southern Ocean paleoceanography is the goal. Answers sought on Paleogene environment, and ice sheet dynamics of the Plio-Pleistocene glaciations.

  - **TBD.** An extant, highly-ranked proposal may be accepted and scheduled in Phase III to address this matter in the northern hemisphere.

- Accurately measuring biogeochemical cycling and fluxes within the Earth system.

  - **Leg 185, Izu Mariana-Bonin.** April - June, 1999. This leg successfully focused on biogeochemical cycle studies and mass balance at convergent margins by determining the net fluxes into this particular subduction zone. Special emphasis was placed on "subduction factory" objectives (results from recent workshops), and on the deep biosphere initiative. "Subduction Factory" objectives – well underway.

- Describing and documenting climate extremes (cold and warm periods) which (1) test the sensitivity of existing climate models, and (2) provide parameters for new model runs used to predict future climate change.

  - **Pacific Paleoceanography.** Two legs (Southeast Pacific Paleoceanographic Depth Transects (proposal 465), and A Paleogene South Pacific APC Transect: Heat Transport and Water Column Structure during an Extreme Warm Climate (proposal 567) will be drilled in 2001 to address this topic.

  - A Program Planning Group named "Extreme Climates and Environments of the Paleogene and Cretaceous" was recently established in the JOIDES advisory structure to foster and promote proposals in this vein. This PPG has identified the highest priority targets for Phase III and beyond.

- Continuing the investigation of global carbon cycling and ocean circulation patterns by drilling additional latitudinal and depth transects, and taking advantage of new stratigraphic and geochemical techniques.

- **Leg 189. Southern Gateways.** March - May, 2000. Latitudinal paleoceanographic transects continue in the Southern Ocean with this leg which will focus on paleocean/climate changes related to the tectonic opening of the Tasmanian Seaway and the Drake Passage, which thermally isolated Antarctica and spawned the Circumpolar Current.

- **TBD.** Two extant, highly-ranked proposals may be scheduled at the September 1999 SCICOM meeting to address this topic in the central equatorial Pacific and in the eastern tropical Pacific. Carbon (carbonate and organic) cycling will be the focus, as will bathymetric depth transects for dissolution studies and paleo-circulation reconstructions. These will complement similar legs as part of a larger global array initiated by the former Ocean History panel.

- Investigating the microbial processes deep in the sedimentary column and links to sediment diagenesis.

  - A new microbiological laboratory was constructed in early 1999 and outfitted using Program funds designated for innovation. The van was fully functional on Leg 185 (April - June, 1999), and experiments were conducted, at the behest of the Deep Biosphere PPG to determine the extent and characterization of contamination of the cored and drilled sedimentary and rock sequences.

  - Partnering with the US Department of Energy (DOE) will result in collaboration and cost sharing. The DOE will purchase—for the ODP and ICP—AES for shipboard use for studies related to gas hydrates and the deep biosphere.

  - Dry dock plans for September - October 1999 include upgrading the microbiological lab by incorporating it into the laboratory stack and adding equipment and capabilities.

  - Legs 192 and 193 will see further scientific developments of this initiative.

- Completing mass balance experiments at a convergent margin by sampling the deeper portions of a forearc to constrain fluid and mass partitioning.

  - **Leg 185, Izu-Mariana.** Cores retrieved during this cruise provided the remaining piece of the crustal input inventory for the Mariana subduction factory. Shore-based geochemical analyses of the basement section in Hole

801C will provide the first robust estimates for subducting oceanic crust with which to compare to volcanic outputs at the Mariana backarc.

- Continuing the offset-section characterization of the lower crust, focusing on sampling long sections through the transition zones between principal components of oceanic crust.

  - **TBD.** An extant, highly-ranked proposal may be scheduled in Phase III to address this matter in the northern hemisphere.

- Examining the characteristics of reaction zones beneath large hydrothermal deposits.

  - **Leg 193, Manus Basin.** Goals are to understand the chemical fluxes, fluid pathways, and ore deposition in this felsic volcanic-hosted polymetallic massive sulfide hydrothermal system.

- Evaluating the dynamics of mantle reservoirs by defining geochemical domains and augmenting seismic observatory installation in drill holes.

  - **Leg 187, Australia-Antarctic Discordance.** November – December, 1999. To investigate relationships of crustal and mantle composition, spreading, and magma supply rates in an area suspected to have unusual mantle dynamics and profound magma supply differences.

  - **Leg 191. Western Pacific ION.** July-August, 2000. Scientists will place a permanent observatory (downhole seismometer) in the tectonically active Western Pacific at a high-priority area identified by the International Ocean Network (ION).

"Failures"/Incomplete Goals

Scientific themes (in the "expensive" category) likely to be impacted by budget/technology constraints during Phase III –

- Seismogenic Zone preparatory drilling and *in situ* monitoring,
- Decadal to millennial scale climate variability,
- Extreme climates,
- Gas hydrates,
- Sections of the oceanic crust, and
- Hydrogeology - Hydrothermal themes.

Expanding on this, there are two ways to view the current technology constraints:

- technology that has not been implemented because of historical precedence; and
- technology that may be beyond the resources and capabilities of the current program.

In the first category, capabilities could be added to the *JOIDES Resolution* (JR) to extend its current range of drilling. One area where proposal pressure is strong is in shallow water environments. With some additional funds, the JR could be modified and safety measures could be implemented to drill in shallower water environments. In the past year, funds were prioritized so that a microbiology facility could be added to the vessel. In a similar manner to this deep biosphere initiative, the budget could be prioritized to significantly improve the JR's capabilities to sample in shallow water.

Taking a different approach, ODP could also identify funds to lease other platforms to achieve some of these shallow water objectives. In the past this has not occurred, but could, in future, depending on annual budget constraints.

In the second category, it is clear the JR does not have the proper technology to achieve many of the lithosphere community's goals. This community has proposed significant modifications to their drilling strategies to better match them with the JR's capabilities (e.g., offset drilling techniques), but major goals in this area have not yet been realized. The Hard Rock Re-entry System (HRRS), using the hammer drill has some potential for spudding into bare rock and stabilizing difficult settings (particularly slower spreading center regions). ODP is currently targeting completion of a prototype system by the end of FY01 for potential use in FY02. This technology will help, but it is not the total solution.

ODP must clearly publicize budget and technology constraints that will impact the success of the Program and highlight the impact of not achieving the goals.

Phase IV - Implementation Strategy

The main concern that PEC-V has with ODP is the perceived lack of progress toward the establishment of a new phase of ocean drilling. The vision for an Integrated Ocean Drilling Program (IODP) for the Twenty-First Century based on two or more drilling vessels exists, but the questions of how and when this vision will be implemented are not clear. Although a number of activities are underway, it is not clear that they will be enough to ensure an uninterrupted accumulation of data and knowledge to solve a number of key scientific and related socioeconomic issues during the next decade.

The Japanese have committed significant funding to the construction of a riser-equipped drilling vessel that will be ready for sea trials in late 2003. The OD21 vessel would not be available to the international community until 2005. During 2003 the ODP will begin a year of transition culminating in the closure of the program.

Before making some comments on the preparedness of the program for post-2003 drilling it is important to establish the base from which PEC-V has formed its opinion. The following summary of events is primarily restricted to non-Japanese planning events and begins with the formation of the International Working Group (IWG) during 1998. An ad hoc US Science Advisory Committee (USSAC) committee produced a report in November 1998 on the Structure of the US Component of a Future Scientific Ocean Drilling Program. An ODP Technology and Operations Workshop was held in late 1998 to begin the planning for a new era of scientific ocean drilling. SCICOM also presented a report to EXCOM on a prioritization process for making budgetary decisions by the ODP in late 1998 – this report highlights the goals of the Long Range Plan that are unlikely to be achieved by the ODP before 2003. IWG commissioned the Integrated Ocean Drilling Program Planning Sub-committee (IPSC) during 1999 and is establishing an office to provide secretariat support for all of the IWG and related activities. The National Oceanographic Partnership Program (NOPP) produced a report entitled "Toward a US Plan for an Integrated, Sustained Ocean Observing System" that has significant implications for IODP. In May 1999 JOIDES hosted the Conference for Multi-Platform Exploration (COMPLEX) to outline the key scientific issues facing the earth science community and to develop drilling strategies to address these issues. As of July 14, 1999 IPSC has met and developed an outline of their activities in relation to ODP's timetable, NSF budgeting schedule and the development of the Japanese vessel. JOIDES EXCOM has recently endorsed IPSC's plan and recommended to IPSC to recruit science planning, industry liaison and technology working groups to help develop the IODP implementation strategy.

It appears from the documents provided to PEC-V that it is unlikely that a new phase of ocean drilling would begin until late 2004 or later leaving a

- significant gap for operational units involved in the support of ocean drilling,
- delay in the completion of goals that were not achieved by ODP, and
- a delay in the start of the new science ventures that require multiple drilling platforms.

Is this acceptable to the community? What are the implications for society, science and support institutions if a new phase of drilling is delayed by 1-2 years? Have these issues been properly addressed? PEC-V was unable to find anyone that appears to have thought through these issues at what, to us, appears to be late in the planning phase for IODP.

Furthermore, if it is agreed that a delay in the transition to IODP is to be avoided, then all parties with a vested interest in the success of IODP must enter a phase of rapid, open communication (including marketing and lobbying) and negotiation during the next two years to ensure that the vision of IODP is realized.

The Japanese effort has been put in motion by the building of a riser capable ship to be part of the future ocean drilling enterprise. JOIDES must take this commitment as a guide and inspiration for the role of the United States and the other countries in the consortium in designing a unified drilling program for the twenty-first century.

There must be a clear leadership established to effect this movement into the new phase of drilling. Someone will have to be identified as the intellectual leader with the capability of harnessing the scientific and political powers of the prospective participants in the program.

The success of the Japanese effort to construct a new ocean drilling ship is in part built on the belief that ocean drilling and the resulting knowledge will be critical for developing strategies to reduce the effects of extreme climatic periods, particularly in countries in higher latitude regions. The survival of descendents is an important argument that has not received a lot of attention in many of the countries involved in the ODP. Professor Noriyuki Nasu's personal belief is that there should be a fleet of drill ships operating around the world addressing a range of scientific and socio-economic issues.

Program Management and Operations

Introduction

Each of the contractors/subcontractors was asked a series of questions. The answers were documented by PEC-V but only the key observations and recommendations are reported.

Prime contractor - JOI

General Questions

- *Is the ODP on track to achieve its goals?*
- *What do the clients (present and future) of the ODP need?*
- *Who/What is going to stop/change/help form the ODP objectives?*
- *What science does ODP need to do?*
- *Does ODP have the resources to achieve its goals?*
- *When should ODP tackle projects - balancing internal and external client needs?*
- *How does ODP know when it has met the objectives in each science area?*
- *How does ODP ensure that the results get to the right people?*
- *How does ODP know when it has done a great job in each science area?*

Specific questions relating to the Long Range Plan

- *Is the implementation strategy working?*
- *Does it need to be changed?*

Science Advice and Coordination

- *Is the new structure working?*

Science Delivery

- *Phase II - were the goals of Phase II achieved?*
- *Phase III - illustrate the progress toward Phase III goals.*
- *Phase IV - Is the ODP ready for all aspects of post-2003 drilling?*

Program Management and Operations

- *Has the Management Improvement Plan (MIP) been successful? Please illustrate the successes and failures.*
- *Is Project Management (PM) in place throughout the subcontractor organizations?*
- *Please report on the success of the enhancements to program operations outlined on page 72 of the LRP.*

- *Please illustrate how the partnership program is being coordinated to ensure that success of Phase III and the preparation for post-2003 drilling requiring multiple platforms.*
- *What is the status of the investigation into drilling platform options? What progress has been made toward the aims for a 2+-ship program in Phase IV?*
- *Is funding adequate for Phase III?*
- *What are the plans for achieving the funding required for a 2+-ship program?*

Observations

- The management of the program is now more efficient and effective than prior to PEC-IV.

Recommendations

- JOI needs to maintain a more visible, up-to-date view of the status of program objectives.
- Program objectives must be presented in a form that allows the non-science community to understand the significance of the work – it is particularly important that the Program is perceived as successful by completing its objectives.
- Innovative funding strategies must be generated to ensure the success of Phase III.
- Both industry and country partnerships must be pursued more vigorously.
- The changes to the advisory structure have been successful but JOI is encouraged to ensure that the communication between EXCOM and the advisory structure is optimal for the successful completion of the Program.
- The LRP needs to be updated to reflect the success of Phase II, the successes in Phase III, and any changes to the programs – this revision will provide the document from which the success of the ODP will be judged.

Subcontractor - TAMU

General Questions

- *Please provide a brief review of the TAMU-ODP and TAMRF organizations.*
- *Please highlight any significant changes since the PEC-IV review.*
- *How has staff make up changed since PEC-IV?*
- *What significant achievements do you think TAMU has made to ODP since PEC-IV?*

- *What are the main performance indicators used to illustrate efficiency and effectiveness of ODP-TAMU operations?*
- *How have you responded to 'failures/delays" (indicating budget busts if any) since PEC-IV?*
- *Please review the communication system between TAMU and the* JOIDES Resolution *and discuss how conflicts are resolved.*
- *What improvements to the existing ODP structure would you like to make?*
- *To what extent have you implemented transition planning for post-2003?*
- *What are your thoughts/concerns on post-2003?*
- *How much emphasis do you pay to existing commercial technology versus an ODP-specific development?*
- *What is your perception of your client list?*
- *How do you manage change internally?*
- *Have you implemented a formal plan for continuous improvement?*
- *Please review your process for engineering development.*
- *What is your opinion of the effectiveness of TEDCOM?*
- *Review the interactions between TAMU engineering and subcontractors concerning third-party tool development.*
- *How do you coordinate each leg with ODL?*
- *To what extent do you ensure the veracity/quality control of data?*

Observations

Since PEC-IV, TAMU has made significant improvements to their operations by reorganizing, instituting project-based management programs and even increasing services with a reduced staff in a constant funding environment. The reorganization was based on user community input and the results of a private management group assessment. The purpose of reorganizing was to better align the group with tasks, to achieve better integration and improve communication. PEC-V believes that the perception of the community is that TAMU is more responsive and that the reorganization efforts have been successful in reducing staff and increasing their work products.

In addition to the above, several significant accomplishments have been made by TAMU since PEC-IV that are worthy of noting:

- A microbiology lab has been installed on the *JOIDES Resolution.*
- The Sedco-Forex contract was renegotiated at a rate much lower than similar industry vessels.
- The Pressure Core Sampler was only a partial success on Leg 164. The HYACE development needs to be ready for future gas hydrate legs.
- The first sea trial was conducted on the Hammer Drill System.

- Staff was reduced from 165 FTE's to a 145 (aiming for 148) while increasing services to the community.
- A new digital delivery system was implemented for reports that significantly reduced report costs.
- The JANUS data base system was installed and made available to the science community.
- Publication of IR's and SR's changed to electronic format.

Recommendations

The few suggestions for improvements include:

- Increasing the pace at which project management policies are implemented within all phases of operations,
- obtaining ISO 9000+ certification for the group,
- continually improving the JANUS data base system with enhancements such as adding new tables and modeling updates, and
- implementing a commercial "ocean routing service" to transit the ship more efficiently from location to location.

The most critical problem facing the TAMU group is the uncertainty related to a post-2003 program. Management has started planning for both a continuing program and the possibility for a possible funding hiatus. However, near-term decisions must be made in order to carry out either possibility and TAMU requires direction soon from NSF.

PEC-V believes that TAMU is serving the community well given their budget constraints. We also support their concerns that NSF needs soon to provide specific direction for implementing post-2003 plans.

Subcontractor - Logging Services Operator (Borehole Research Group)

General Questions

- *Please provide a brief review of the Borehole Research Group.*
- *Please highlight any significant changes since the PEC-IV review.*
- *What significant achievements do you think Borehole Research Group has made to ODP since PEC-IV?*
- *What are the main performance indicators used to illustrate efficiency and effectiveness of Borehole Research Group operations?*
- *Has the staff make up changed since PEC-IV?*

- *How have you responded to 'failures/delays" (indicating budget busts if any) since PEC-IV?*
- *Please review the communication system between Borehole Research Group and the* JOIDES Resolution *and discuss how conflicts are resolved.*
- *Is the distributed model for logging contractors working well?*
- *What improvements to the existing ODP structure would you like to make?*
- *To what extent have you implemented transition planning for post-2003?*
- *What are your thoughts/concerns on post-2003?*
- *How much emphasis do you pay to existing commercial technology versus an ODP-specific development?*
- *What is your perception of your client list?*
- *How do you manage change internally?*
- *Have you implemented a formal plan for continuous improvement?*

Observations

Overall the ODP Logging Services have done a good job meeting their contractual responsibilities. The services consist of the Borehole Research Group at LDEO, plus four small offices at the following institutions: CNRS (Laboratories de Mesures en Forage (LMF), France; University of Leicester, United Kingdom; University of Aachen, Germany; and the Ocean Research Institute, University of Tokyo, Japan).

It appears that distributing the responsibility for supplying seagoing logging scientists is cost effective, because it is difficult to maintain these scientists at one location—the various "parts" of logging scientists from all international offices add up to about 6 Full Time Equivalents (FTEs). The group was successful in maintaining a good level of service, and innovation despite flat overall budget and increases in Schlumberger subcontract costs. Co-chiefs and others have given logging services good reviews.

The Logging Services website has become the primary means of distributing log data and is widely used.

Significant achievements

- Logging is now a routine part of the ODP.
- Data collected on the JR is now received at LDEO via a high-speed satellite transmission, where it is edited and refined then transmitted back to the ship within five days. This procedure permits the coupling of borehole data with the actual drill core record.
- All logging data, including the historical logging data since Leg 101, is now available through the Logging Services website.
- The internationalization of logging services has been a success.

Concerns

- One concern that was raised was the possibility that logging staff at sea is duplicated-with one BRG scientist and a second one from the scientific community. This appears now to be a minor issue: BRG is obligated by contract to provide a logging specialist if only to direct the Schlumberger engineer and operation, whereas it is up to the chief scientist's discretion to bring on board a second specialist from the scientific community.
- Scientific opportunities for integrating logging and site survey data are missed because digital survey data are not routinely archived at the Site Survey Data Bank. Members of PEC-V were shown some logging-seismic integrated studies, which were only available because the PI who collected the data made them available. Digital seismic data should be routinely submitted to the Data Bank and made freely available for use by the drilling community.
- It is expensive to acquire quality seismic data, and the process involved in obtaining funds for this purpose is difficult. The problem will only grow worse because the riser vessel will require a great deal of expensive, 3D survey data.
- Significant knowledge and expertise exist in the logging services institutions and it will be important to try and retain and utilise this expertise in post-2003 drilling operations.
- Calibrated lithostratigraphic profiles are not routinely available. Good examples of lithostratigraphic profiles have been provided by the Aachen group under subcontract to the BRG. The Committee would like to see these profiles routinely generated either on the ship or within a few months of the conclusion of a leg.

Major Issues/Recommendations

Site Survey Funding & Use and Post-Cruise Science Funding

PEC-V finds that funding is especially lacking in two areas. Geophysical site surveys are now funded separately and the results are not routinely integrated into the drilling programs. As such, we recommend that the site survey data sets used to select drill sites be included as non-proprietary data within all drilling programs once the leg has been approved for drilling. In addition, the scientist(s) holding the seismic data set used for the approved leg should be included in the scientific party of that leg as a shore-based member to guarantee the full integration and interpretation of such data into the scientific process.

The resources required to store and distribute digital seismic data by the Site Survey Data Bank to the drilling community are considerable. The two-ship program will require even more resources to ensure the availability of digital seismic data.

PEC-V also recommends that more funds be available for post-cruise science funding. In addition, specific funding should also be designated for "public relations" efforts to advertise results and their anthropogenic implications to the science community, funding agencies and the general public.

Budgeting Considerations

PEC-V is concerned that the flat funding situation controlling the ODP budget will not only prevent some science from being accomplished before 2003 but it is also negatively impacting technological advances needed during the current program phase as well as for the post-2003 program. To date the situation has been tractable only because of enhanced efficiencies in operation and cost savings, but it could quickly become disastrous if inflation increases. Flat funding is also perceived as a negative in developing a post-2003 program. The committee therefore recommends ramping up funds to be used for multiple-platform research efforts and refitting or replacing the *JOIDES Resolution.*

Publications

The change to electronic format for the ODP Proceedings volumes has had a mixed reception by the scientific community but the change is supported by PEC-V. We suggest that ODP-TAMU pay careful attention to the community criticism and make

modifications that will continue to improve the delivery of results to a science community that is in the throes of a revolution involving information access and delivery.

In addition, efforts should continue to increase the volume of ODP publications in the open literature, especially peer-reviewed journals. This not only alleviates the criticism concerning accessibility of information, but also raises the level of acceptance of this information.

Data Quality/Integration

Shipboard Data. PEC-V perceives a growing problem concerning the veracity of data from the several petrophysical streams (discrete measurements, pass-through data, and downhole logging) and with the integration of these data. This is a complex problem involving improvement of equipment, creation of software to improve the uneven quality of pass-through data, and "standardization" of log-core integration.

Science Advice and Coordination

Observations

The Science Advice and Coordination structure was recently changed. The new advisory structure is in place and is becoming increasingly efficient and effective as each issue (such as teething problems associated with the transition to the new structure) is dealt with by JOI, the JOIDES office and the advisory structure as a whole.

Participation by individuals and institutions has increased in the program despite a reduction in the number of panels.

The SSEPs and PPGs are now working well and are seen as a good improvement and essential for implementing the LRP. SCICOM/OPCOM mandates are good, but not functioning as well as they could – see below. The new SCIMP has a number of problems that need to be solved. The other advisory groups remained unchanged. TEDCOM's mandate is for future technology in ODP. With the short time left in ODP and the normally long-lead time for technology development, this group may be better utilized for advice in a future ocean drilling program.

Issues/Recommendations

SCICOM, OPCOM and SSEPs. PEC-V observed that conflicts have, and may continue to emerge concerning decisions on drilling locations. Some proposals ranked lower by the SSEPs have been selected for the drilling schedule, instead of more highly ranked proposals. Also, they existed where SCICOM ranked several locations as highest priority, leaving the final selection to OPCOM, and then formally approving the decision via e-mail.

PEC-V proposes that these processes should be made fully transparent and the reasons for the decisions made known to the science community. We commend the decision to hold the OPCOM meeting in the middle of future SCICOM meetings. The ability for SCICOM to consider OPCOM's recommendations immediately after they meet is an important improvement to the process.

The most recent terms of reference for Program Planning Groups (PPG) are very concise and should ensure an improvement in their interaction with the ODP advisory system.

Scientific Measurements Panel (SCIMP)

PEC-V observed that with the integration of three service panels (Downhole Measurements, Information Handling, and Shipboard Measurements Panel) into one, the Scientific Measurements Panel (SCIMP), much expertise and engagement cannot be accessed during panel meetings. PEC-V considered whether the possibility of bringing in additional information by setting up ad hoc advisory committees (*Guide to ODP*, Appendix III, 12.4) would be sufficient. Because of the importance of these issues, and the continuous need, we recommend that two subgroups of SCIMP should be established concerning downhole measurements and information handling. These subgroups should meet just before the SCIMP meets to prepare important relevant issues and foster necessary developments.

Fifth Performance Evaluation of the Ocean Drilling Program

Contractor and Subcontractor Responses

February 2000

Prepared by:
Joint Oceanographic Institutions Incorporated
Joint Oceanographic Institutions for Deep Earth Sampling
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Introduction

This document contains ODP subcontractor responses to concerns and recommendations stated in the report of the Fifth Performance Evaluation Committee (PEC-V), dated October 1999. The report section and page number are shown, followed by the relevant text from the PEC-V report. The subcontractor response appears indented below the text from the report excerpt. More specific actions and timelines will be presented by JOI at the June 2000 EXCOM meeting.

Executive Summary, page 1

- **The main concern of PEC-V is that current plans suggest that the implementation strategy for the Integrated Ocean Drilling Program (IODP) for the Twenty First Century (Phase IV), may result in a gap in drilling operations of as much as two years as Phase III (ODP) ends. The size of the gap will depend on the specific drilling platform requirements of the new program and the ability of the ocean drilling community to implement the current plan at a faster pace.**

  Since the completion of the PEC-V report, planning efforts toward the new phase of ocean drilling have accelerated. These developments have been reported to the JOIDES advisory structure and governmental funding entities. Increased efforts must continue, however, to ensure that a new program is funded.

  Definition of the new advisory structure, and suggested management of the new program is important for ODP as we develop the phase-out plan for the current program. The next JOIDES Office will develop a transition plan for the advisory structure from ODP to the new program.

  Concerns regarding a gap in drilling have been relayed to the International Working Group (IWG), through the NSF.

Program Management and Operations

Prime Contractor - JOI, page 16

- **JOI needs to maintain a more visible, up-to-date view of the status of program objectives, and**
- **Program objectives must be presented in a form that allows the non-science community to understand the significance of the work – it is particularly**

important that the Program is perceived as successful by completing its objectives.

JOI has initiated the compilation of scientific results that are published in highly-ranked peer-reviewed journals. This compilation is currently structured under the themes of the Long Range Plan, and will be used to develop ODP "legacy" documents in the style of the U.S. Science Support Program's "ODP's Greatest Hits" document.

- **Innovative funding strategies must be generated to ensure the success of Phase III.**

  JOI has begun exploring innovative funding strategies by working with the U.S. Department of Energy to support gas hydrates research, the NSF LEXEN ("Life in Extreme Environments") program to support microbiological research, and JAMSTEC in Japan to support joint engineering developments. This strategy will continue until the end of ODP.

- **Both industry and country partnerships must be pursued more vigorously**

  Industry partnerships are being pursued for both joint technology and science collaborations. A recent ODP/industry workshop held jointly with the U.S. Science Support Program has resulted in the preparation of six industry-related ODP pre-proposals.

  Membership is being pursued with several countries, but efforts have focused on Ireland and India.

- **The changes to the advisory structure have been successful but JOI is encouraged to ensure that the communication between EXCOM and the advisory structure is optimal for the successful completion of the Program.**

  JOI will continue to assist with communications between EXCOM and its advisory committees within the JOIDES advisory structure. To this end, the February 2000 meetings of SCICOM and EXCOM were held jointly, partly for the purpose of enhancing communication.

- **The LRP needs to be updated to reflect the success of Phase II, the successes in Phase III, and any changes to the programs – this revision will provide the document from which the success of the ODP will be judged.**

Planning is now fully underway for the successor program. Achievements in ODP related to the Long Range Plan will be included in the new Science Plan.

Subcontractor – Texas A&M University, page 18

- **Increasing the pace at which project management policies are implemented within all phases of operations**

  Project management policies were phased into operations at ODP/TAMU starting in FY97. By the end of FY98, project management had been incorporated and was used as a management tool for all our project-directed activities. A major achievement was the successful transition to Leg Project Management enabling us to define costs associated with the delivery of science for all highly ranked proposals. These data are available to OPCOM in August of every year when OPCOM creates the schedule for ODP operations. Following the creation of the schedule by OPCOM, the Leg Project Management team for each of the scheduled legs refines the budget in time for incorporation into ODP's yearly Program Plan. In addition to Leg Project Management, all developmental activities that involve science, engineering, data management or publications are managed on a project basis. For example, the successful transition of the Program from published books to electronic publications was successfully managed and implemented as an electronic publications project. Areas of our operation where we manage activities on a functional basis are the publication of our scientific products where our staff works on as many as 24 books at a time, and in the areas of computer network and administrative support. Given our broad and diverse requirements for science delivery, we believe that we have crafted an appropriate balance between project-based and functional departmental activities.

- **Obtaining ISO 9000+ certification for the group**

  ISO is a system that develops quality management and quality standards for the following technical fields: mechanical engineering; basic chemicals; non-metallic materials; ores and metals; information processing; graphics and photography; agriculture; building; special technologies; health and medicine; basic subjects; environment; and packaging and distribution of goods. ISO standards are market-driven and are developed on the basis of international consensus among experts from the sector which has expressed a requirement for a particular standard.

After reviewing ISO, we do not believe that ISO 9000 is a good fit with ODP. Moreover, we achieve the outcome of an ISO process (quality control and consumer responsiveness) in another fashion that is consistent with, and an outgrowth of, the JOIDES Advisory structure. The requirements for service delivery for ODP are rather unique in that the nature of the products that we produce are defined by the community we serve, and the quality of these products are all routinely reviewed by the experts that populate the JOIDES Advisory Panels. The JOIDES Advisory Panels (i.e., SCICOM, OPCOM, SCIMP, TEDCOM, PPSP) review our operations, the character of our products and the quality of performance on a routine basis. If changes are thought necessary, recommendations are made to JOI and we respond to their directives. Two recent examples of the effectiveness of this process have been the incorporation of a microbiology laboratory into our at sea operations and the incorporation of a new analytical tool, an Inductively Coupled Plasma (ICP) system, on board the *JOIDES Resolution*. Both these new analytical capabilities were identified by our customer base, recommendations about protocol and procedures were made through the JOIDES Advisory Panels to JOI, and we were instructed to implement them. Therefore, we believe that the JOIDES Advisory structure provides a very effective mechanism that develops quality standards that then can be implemented by the ODP management team.

- **Continually improving the Janus data base system with enhancements such as adding new tables and modeling updates**

  Customization of specific task applications to allow the efficient import and export of Janus data remains a high priority. Currently 55 application tasks are identified for completion. These tasks were prioritized based on safety and science implications, as well as resources requirements. Three task application groups were identified. Group 1 applications include projects requiring further definition. Most of these projects involve new equipment developments such as, microbiology, ICP, Fusion, and Digital imaging systems. Group 2 and Group 3 applications include currently acquired data. These two groups are subdivided based on the estimated resource requirements necessary for completion. Group 2 applications require significant resources (>120 hrs.) and Group 3 applications require minimal effort to complete. An implementation strategy that combines the application tasks with available resources (both personnel and funding) is being completed for review and implementation in February.

  To date, 50 JANUS data queries have been completed including applications specific to coring summaries, physical properties, paleontology, paleomagnetics and chemistry. Specific information about applications is

available on the Janus database web page (http://janusaxp.tamu.edu/predef_queries/links/links_all.shtml). In addition, an effort is underway to develop a generic upload application. This application will become the standard upload routine applicable for most task applications. Completion of this upload routine will improve efficiency in the completion (turn around, coding and debugging) of the remaining application tasks. This generic application is currently being Beta tested during Leg 188. A similar generic report routine also is under consideration for development.

Progress in the migration of the existing datasets into the Janus database also continues, but is progressing slowly given that only one FTE is assigned to this activity. Migration of the Shipboard MST, GRAPE, and Natural Gamma data has been completed for Legs 161 through 170. Migration of most P-WAVE data sets has been also completed for Legs 162-170. Complete migration of these datasets (Legs 101-160) is expected during FY00.

- **Implementing a commercial "ocean routing service" to transit the ship more efficiently from location to location.**

Ocean routing services provide a wide range of information services focused on the marine shipping industry. Germane to ODP interests, an ocean routing service can provide weather forecasting for an area along a track. An ocean routing service employs a group of forecasters who routinely monitor numerous data sources (NOAA, National Weather Service, etc.), analyze these data sets, and provide forecasts at a frequency required by the client. The duration of the forecast is also customer-defined and can be tailored to meet a broad range of requirements (i.e. 24 hours, 48 hours, 4 days, etc.). These data are transmitted to the ship by telex or e-mail at an agreed upon frequency (e.g. multiple times per day, daily, every other day). In addition, more specialized services can be obtained like typhoon monitoring or ice sheet monitoring, but we routinely employ these services as necessary. The costs for routing vary depending on the region of operations and the variables mentioned above, but costs routinely run between 100 to 300 US dollars per day.

We believe that these kinds of data could be very beneficial to operations under a range of our operating conditions and could provide the Captain and Officers of the *JOIDES Resolution* with a very important source of data. For example, when faced with long transits between work areas that take us across large bodies of water, or when working in a region with challenging environmental conditions (i.e. typhoons), a weather forecast supplied by an ocean routing service could be very beneficial. We have asked for an example of the weather forecasting reports provided and a better definition of costs as they apply to our particular operational needs. If these examples of

environmental data are meaningful and appear useful to the Officers of the *JOIDES Resolution*, we will employ the service for those appropriate selected operations.

Subcontractor - Logging Services Operator (Borehole Research Group) page 20

- **One concern that was raised was the possibility that logging staff at sea is duplicated-with one BRG scientist and a second one from the scientific community. This appears now to be a minor issue: BRG is obligated by contract to provide a logging specialist if only to direct the Schlumberger engineer and operation, whereas it is up to the chief scientist's discretion to bring on board a second specialist from the scientific community.**

  The responsibilities for scientists filling these two positions on *the JOIDES Resolution* are distinct, the Logging Staff Scientist being the contractual representative. Significant collaboration among the scientific party concerning log data acquisition and analysis does occur, especially when large efforts are needed for special logging operations (e.g. VSP, 3rd party tools, etc.) or for core-log-seismic integration (e.g., whole-round core scanning). Changes in the JOIDES scientific positions are currently under discussion among JOI, TAMU and LDEO to more clearly represent the description of the current tasks on the *JOIDES Resolution*.

- **Scientific opportunities for integrating logging and site survey data are missed because digital survey data are not routinely archived at the Site Survey Data Bank. Members of PEC-V were shown some logging-seismic integrated studies, which were only available because the PI who collected the data made them available. Digital seismic data should be routinely submitted to the Data Bank and made freely available for use by the drilling community.**

  To date, log-seismic data integration has been undertaken on the *JOIDES Resolution* as an ad-hoc activity. That is, when a shipboard scientist or co-chief scientist is interested and provides the relevant seismic data in digital form. BRG has provided software for basic log-seismic integration capabilities (e.g. 1-D synthetics), although this has not been routine, and has done so usually by request. For certain legs, individual PI's have brought commercially-licensed software packages with them to sea for their personal use.

In January 1999, SCIMP recommended that that BRG evaluate commercial seismic software packages to move ODP towards better integration of digital seismic data for shipboard science. Since then, commercial software that enables synthetic seismograms and time-depth profiles to be calculated has been reviewed. Among these packages, GeoQuest's IESX software offers basic functions as well as powerful seismic processing and data handling capabilities that are of broader interest. While addressing the SCIMP recommendation, this capability also brings up several questions about ODP Site Survey policy that were of concern to PEC-V, such as data storage, access, and confidentiality.

As a start towards framing these questions for JOIDES and ODP, BRG is in the midst of planning a pilot study this year to format digital seismic data and to test the IESX software on the Resolution during Leg 188 and for 1-2 future cruises. Additional shore-based licenses for the software may be made available after the pilot study. Evaluation of the procedures and level of effort that would be needed for routine digital data access is the long-term objective.

- **It is expensive to acquire quality seismic data, and the process involved in obtaining funds for this purpose is difficult. The problem will only grow worse because the riser vessel will require a great deal of expensive, 3D survey data.**

  In the post-2003 program, data access and handling issues related to 3D seismic surveys, as well as seismic-log data integration, will also likely increase. To anticipate these changes, the ODP site survey policy during the current program should be reviewed.

- **Significant knowledge and expertise exist in the logging services institutions and it will be important to try and retain and utilise this expertise in post-2003 drilling operations.**

  We agree that a significant amount of expertise and experience has accumulated at the ODP Logging Services institutions since 1984. However, it will be increasingly difficult to retain personnel well before the current program ends, if it is perceived that a significant hiatus in operations or a change in service providers is imminent. As noted by JOI to NSF, action should be taken as soon as possible to reduce this risk.

- **Calibrated lithostratigraphic profiles are not routinely available. Good examples of lithostratigraphic profiles have been provided by the Aachen group under subcontract to the BRG. The Committee would like to see**

these profiles routinely generated either on the ship or within a few months of the conclusion of a leg.

This topic was not discussed during the PEC visit to LDEO and their understanding that this work was performed under subcontract to BRG is not correct. Two Aachen scientists were approved as shore-based investigators to provide these profiles for two particular drilling legs. Their proposal was discussed at DMP in March 1996, then at subsequent SCIMP meetings, and trial projects were supported during Leg 173 and Leg 176. Characteristic electrofacies ("log units") were interpreted from core and log data roughly one-month post-cruise. After some discussion among the co-chiefs, scientific parties, TAMU, LDEO, DMP and SCIMP, their reports were submitted as shore-based log processing sections within the site chapters and reviewed by the Editorial Review Board for each IR volume. As of Feb 1998, SCIMP was only concerned about the manner of publication of the results, not the mechanism of including Aachen scientists as shore-based investigators for appropriate legs.

In summary, the capability to provide lithostratigraphic profiles within a short time after the end of a leg is already in place, so long as it is approved as a shore-based contribution. It is not appropriate for this to become a contractual task of ODP Logging Services given the degree of scientific interpretation and shipboard collaboration needed to generate a useful profile. However, BRG will provide the processed logs immediately after the leg to approved shore-based scientists and can suggest similar shore-based processing to the co-chiefs of future legs during pre-cruise meetings. Providing the results to the shipboard party within a short time after completion of the leg is then the responsibility of the shore-based investigator.

Major Issues/Recommendations

Site Survey Funding and Use, page 21

- **PEC-V finds that funding is especially lacking in two areas. Geophysical site surveys are now funded separately and the results are not routinely integrated into the drilling programs. As such, we recommend that the site survey data sets used to select drill sites be included as non-proprietary data within all drilling programs once the leg has been approved for drilling. In addition, the scientist(s) holding the seismic data set used for the approved leg should be included in the scientific party of that leg as a shore-based**

member to guarantee the full integration and interpretation of such data into the scientific process.

- **The resources required to store and distribute digital seismic data by the Site Survey Data Bank to the drilling community are considerable. The two-ship program will require even more resources to ensure the availability of digital seismic data.**

  The key concern regarding the Site Survey Data Bank noted in the PEC-V Report was the lack of submission and archiving of digital seismic data for proposed drill sites. As these data have only occasionally been submitted by the proponents, they are not routinely available to the shipboard scientists for integration with other data sets. The Data Bank does not discourage submission of digital data, but has not required their submission by proponents, primarily for two reasons:

  - The infrastructure to store, retrieve, display and plot-out digital seismic data is significant, and would require an increase in funding to the Data Bank to develop.

  - The ease of reproduction of these data raises security issues. Any system developed will have to have adequate safeguards built in to reassure proponents that their data will not be used outside of the scope of the drilling program. The Data Bank can guarantee this only to the point that the data is sent to the ship. Any system developed to do this routinely will need to have someone on the ship charged with controlling access to the data.

  However, to move toward the goal of archiving digital seismic data, the Data Bank has been working with the ODP Logging group to test the IESX system for seismic-log integration. This system provides an environment in which digital seismic data can be organized into projects, and which allows the display and output of both basemaps and lines. The system is to be tested with survey data on Leg 188. These data were loaded into the IESX system at LDEO and taken to the ship for use by the shipboard party. This test is being done with no additional cost to the Data Bank through the use of the Logging Group's site license for IESX, and the use of data already in hand from a scheduled Leg. However, routine use of this system for data from 20 – 30 active proposals will require additional resources to implement. We will have a clearer view of these costs post-Leg 188.

  IESX provides for password protection for the seismic data, however a program-wide rationale for access control will need to be developed as these

data will traverse subcontract boundaries. Care should be taken when formulating an access control policy that the system protects the interests of those depositing data into it, or provides them with some compensation for their submission (e.g. shorebased scientist status within the science party). Insisting that all data submitted are non-proprietary may foster a reluctance to submit recently acquired survey data.

Post-cruise funding, page 21

- **PEC-V also recommends that more funds be available for post-cruise science funding.**

  The program agrees with this recommendation because it would enhance the scientific return from ODP, but this is a matter for each member country's consideration.

Budgeting Considerations, page 21

- **PEC-V is concerned that the flat funding situation controlling the ODP budget will not only prevent some science from being accomplished before 2003 but it is also negatively impacting technological advances needed during the current program phase as well as for the post-2003 program. To date the situation has been tractable only because of enhanced efficiencies in operation and cost savings, but it could quickly become disastrous if inflation increases. Flat funding is also perceived as a negative in developing a post-2003 program. The committee therefore recommends ramping up funds to be used for multiple-platform research efforts and refitting or replacing the *JOIDES Resolution*.**

  The continued pressure of flat-funding on ODP operations has been accommodated over the past five years by careful management and cost control. Flat funding through the remaining years of Phase III will almost certainly require some reduction in Program services – this is not the signature of an expanding program. Ramping up budgets in ODP would be a positive step towards IODP, particularly in innovative areas related to multi-platform operations.

Publications, page 21

- **The change to electronic format for the ODP Proceedings volumes has had a mixed reception by the scientific community but the change is supported by PEC-V. We suggest that ODP-TAMU pay careful attention to the**

community criticism and make modifications that will continue to improve the delivery of results to a science community that is in the throes of a revolution involving information access and delivery.

In addition, efforts should continue to increase the volume of ODP publications in the open literature, especially peer-reviewed journals. This not only alleviates the criticism concerning accessibility of information, but also raises the level of acceptance of this information.

The program will continue to review electronic publications. Normally this review takes place during the annual co-chief scientists' review meeting. All agree that increasing the number of ODP publications in the open literature is important, and the program is now making an effort to track the peer-reviewed publications within the framework of the long range plan.

An example of the numbers of peer–reviewed ODP articles that exist in the open literature from 1995 to 1999 are shown in the table below.

Total # of articles	Geology	Nature	Paleoceanography	Science
Dynamics of Earth's Environment	76	48	131	37
Dynamics of Earth's Interior	59	38	0	14
Total	130	85	131	50

Note: totals differ because some papers address topics in both LRP themes

Data Quality/Integration, page 22

- **Shipboard Data. PEC-V perceives a growing problem concerning the veracity of data from the several petrophysical streams (discrete measurements, pass-through data, and downhole logging) and with the integration of these data. This is a complex problem involving improvement of equipment, creation of software to improve the uneven quality of pass-through data, and "standardization" of log-core integration.**

To our knowledge, there has been no mention of problems with the veracity of logging data or log processing from co-chiefs or shipboard scientists, though certainly log data quality varies from hole-to-hole due to drilling conditions. The integration of core and log data is now routinely available with new software released during 1999 (Sagan v1.0). Though some interpretative skill is

required, simply having the capability of Sagan on the JOIDES Resolution will tend to make core-log integration more "standardized" and routine over time.

Science Advice and Coordination

- **SCICOM, OPCOM and SSEPs. PEC-V observed that conflicts have, and may continue to emerge concerning decisions on drilling locations. Some proposals ranked lower by the SSEPs have been selected for the drilling schedule, instead of more highly ranked proposals. Also, they existed where SCICOM ranked several locations as highest priority, leaving the final selection to OPCOM, and then formally approving the decision via e-mail.**

  PEC-V proposes that these processes should be made fully transparent and the reasons for the decisions made known to the science community. We commend the decision to hold the OPCOM meeting in the middle of future SCICOM meetings. The ability for SCICOM to consider OPCOM's recommendations immediately after they meet is an important improvement to the process.

  These differences arise because a) SCICOM is charged with making the selection of potential legs from a large group of candidate proposals, making an effort to ensure that the overall outcome of the program maximizes the scientific return in the context of the goals set by the Long Range Plan, and b) OPCOM is charged with ensuring the maximum scientific return on the investment of time and money. Given the different goals of these groups there will always be some differences of opinion about what should have been selected and included in the schedule for drilling.

Scientific Measurements Panel (SCIMP)

- **PEC-V observed that with the integration of three service panels (Downhole Measurements, Information Handling, and Shipboard Measurements Panel) into one, the Scientific Measurements Panel (SCIMP), much expertise and engagement cannot be accessed during panel meetings. PEC-V considered whether the possibility of bringing in additional information by setting up ad hoc advisory committees (*Guide to ODP*, Appendix III, 12.4) would be sufficient. Because of the importance of these issues, and the continuous need, we recommend that two subgroups of SCIMP should be established concerning downhole measurements and information handling.**

These subgroups should meet just before the SCIMP meets to prepare important relevant issues and foster necessary developments.

This concern is part of the more complex problem of the role of SCIMP in the ODP phase-out and the transition to IODP. This will become one of a number of matters related to the development a phase-out plan that will be discussed by EXCOM at its meeting in February, 2000.

SCIENCE OPERATOR'S EXCOM REPORT

Review of Activities January 2000 through May 2000

Executive Overview

In terms of programmatic delivery, the last five months have been very successful. Just a few weeks ago the Program concluded the last of three legs in the Southern Ocean (Leg 187: November-January, Antarctic Discordance; Leg 188: January-March, Prydz Bay; Leg 189: March-May, Southern Gateways). Although operating under challenging and hostile environmental conditions, the operational team delivered and the scientific objectives of each leg were achieved (Leg Preliminary Reports 187, 188 and 189). During these Southern Ocean legs, residual tasks related to dry dock activities were completed (e.g. outfitting of laboratories and conference room in the new labstack level was completed) and new equipment was tested and commissioned (i.e. Automatic Station Keeping, Synchronous Generator, Rig Instrumentation and Active Heave Compensation). By the time EXCOM convenes in late June, all the new equipment installed in dry dock should be fully operational and the *JOIDES Resolution* will be much more capable in terms of operations and service delivery.

The Program is, however, not doing as well in terms of the FY00 budget because of the excessively high rates for fuel. Over the last 15 years, the average price paid for fuel is 203 dollars/metric ton. During this fiscal year we have witnessed a steady escalation in fuel prices that have ranged from 188 dollars/metric ton in November 1999 to 288 dollars/metric ton in May 2000. Fuel prices of 300 dollars/metric ton or more are expected at the next port call in July. In our FY00 Program Plan, ODP budgeted fuel at 200 dollars/metric ton. Moreover, increased fuel costs in the global market have stimulated an increase in the inflationary indicators and the Program experienced an increase in the day rate for the *JOIDES Resolution* sooner than projected in our FY00 Program Plan. As such, we are projecting approximately a 600 thousand dollar shortfall in FY00. We have aggressively frozen vacant positions through FY00, deferring some bulk purchases for expendable material (e.g. core liners and core bits) until FY01 and restricting all but essential travel and training. These measures are not without deleterious consequences (i.e. loss of productivity due to unfilled positions) and risks (i.e. inventory levels will be low and deferred costs will roll over to the FY01 budget which is already very tight), but we are making every attempt to maintain our service deliverables at a minimal cost.

In May we finished assembling the ODP/TAMU FY01 Program Plan. Our projected budget for FY01 is very lean ($38,549,791) and is $489,943 dollars less than our FY00 budget. This is a very constrained budget and our ability to support the full range of science services is stretched. Because many of our costs are tied to economic parameters that have increased significantly in the last year (e.g. fuel, day rate, airfares, drilling supplies, equipment, and salaries), the resources available to

support our core activities get smaller and smaller. In FY01 we have had to take several significant risks in order to meet out programmatically defined budget. We have projected fuel costs in FY01 to have settled back down to their historical average of $200 per metric ton. Presently, marine fuel costs are approximately $300 per metric ton. Three positions that were unfilled have been frozen for FY01. Two of the positions are in Drilling Services and the absence of these FTEs will reduce the rate of engineering development for downhole drilling tools and shipboard equipment (i.e. Rig Instrumentation and AHC). The other frozen position is in Science Services and was defined to support and enhance activities related to our shipboard laboratory requirements. A scheduled refurbishment of one of our drill strings will be delayed indefinitely. A long delay in this activity will result in corrosion and compromise the longevity of the drill string. It is unsettling to take these risks, but the alternative is to reduce the services provided and the associated staff. If costs continue to rise against a constrained budget the only alternative will be to limit the kind of science operations that the Program pursues at a time when we should be doing our most exciting science, and/or reduce services, with an associated reduction in FTEs.

Introduction

In an effort to codify relevant information and to streamline the review of the Science Operator's activities, as much information as possible is presented in tabular form. These data are presented by functional department.

Science Services

Schedule of Science Operations for the *JOIDES Resolution*: January, 2000 – May, 2002

	Leg	Port (Origin)[†]	Dates [a]	Total Days (port/sea)	Days at Sea (transit/on site)	TAMU Contact	LDEO Contact
188	Prydz Bay	Fremantle	12 January - 12 March '00	60 (5/55)	22/33	C. Richter	T. Williams
189	Southern Gateways	Hobart	12 March - 13 May '00	62 (4/58)	12/46	M. Malone	U. Ninnemann
Transit (Townsville-Guam)		Townsville	13-24 May '00	11 (3/8)	8/0	B. Julson	N/A
190	Nankai I	Guam	24 May - 17 July '00	54 (1/53)	7/46	A. Klaus	S. Saito
191	W. Pacific Ion/HD Engineering	Yokohama	17 July - 13 September '00	58 (5/53)	12/41	C. Escutia/L. Holloway	V. Louvel/TBN
192	Ontong Java	Guam	13 September - 12 November '00	60 (5/55)	15/40	P. Wallace	G. Cairns
193	Manus Basin	Guam	12 November - 9 January '01	58 (5/53)	9/44	J. Miller	G. Iturrino
194	Marion Plateau	Townsville	9 January - 5 March '01	55 (5/50)	13/37	P. Blum	H. Delius
195	West Pacific Ion	Guam	5 March - 11 April '01	37 (5/32)	7/25	C. Richter	V. Louvel
196	Nankai II [*]	Kaohsiung	11 April - 10 June '01	60 (5/55)	9/46	A. Klaus	S. Saito
197	Hotspots	Yokohama	10 June - 10 August '01	61 (5/56)	21/35	G. Acton	F. Einaudi
198	Paleogene	Honolulu	10 August - 9 October '01	60 (4/56)	20/36	C. Escutia	P. Fothergill

199	Gas Hydrates	Victoria	9 October - 6 December '01	58 (5/53)	5/48	M. Malone	D. Goldberg
200	H2O ¥	San Francisco	6 December - 13 January '02	38 (5/33)	18/15	T. Davies	Y. Sun
201	SE Paleoceanography ¥	Panama City	13 January - 10 March‡ '01	56 (5/51)	21/30	P. Wallace	U. Ninnemann

Notes:
[a] Port call dates have been included in the dates which are listed. For example, Leg 189 begins on 12 March with 4 days of scheduled port call. The scheduled sailing date is 16 March.
† Although 5 day port calls are generally scheduled, the ship sails when ready.
* Mid-leg port calls may occur for Legs 196 and 199.
‡ Leg 201 is tentatively scheduled to end in Valparaiso.
¥ Legs 200 and 201 require EXCOM approval.

9 March 2000

Co-Chief Scientists and Cruise Staffing for Science Operations

Co-Chief Scientists for Legs 188-201:

	Leg	Co-Chief Scientists
188	Prydz Bay	A. Cooper P. O'Brien
189	Southern Gateways	N. Exon J. Kennett
190	Nankai I	G. Moore A. Taira
191	W. Pacific Ion/HD Engineering	T. Kanazawa W. Sager
192	Ontong Java	J. Mahoney J.G. Fitton
193	Manus Basin	R. Binns F. Barriga
194	Marion Plateau	F. Anselmetti A. Isern
195	West Pacific Ion	M. Shinohara TBN
196	Nankai II	K. Becker H. Mikada
197	Hotspots	J. Tarduno R. Duncan
198	Paleogene	M. Lyle P. Wilson
199	Gas Hydrates	A. Trehu G. Bohrmann
200	H2O	R. Stephen J. Kasahara
201	SE Paleoceanography	A. Mix R. Tiedemann

Scientific Party Staffing:

Staffing for Legs 190 and 191 is complete, Legs 192 and 193 is in progress, and we are just beginning staffing Leg 194.

A disturbing trend is the sharp decrease in the numbers of applications received by ODP/TAMU for legs beyond 193. Tabulated below are the numbers of applications on file as of May 26, 2000.

Leg	Total Applicants	U.S. Applicants	U.S. Students	Non-U.S. Applicants	Non-U.S. Students
190	43	13	6	17	7
191	30	8	4	10	8
192	68	14	7	35	12
193	46	4	6	22	14
194	23	8	1	9	5
195	4	2	0	2	0
196	5	2	1	2	0
197	10	1	1	7	1
198	12	6	0	5	1
199	7	0	1	5	1

200	0	0	0	0	0
201	7	1	0	4	2

Aside from the long lead time for legs 194 and beyond, another factor contributing to the decrease may be that Legs 195, 196 and 200 are primarily concerned with implanting downhole instrument packages, rather than coring.

Shipboard Participant Tally:

Please reference Table 1 on page 5 for a compilation of all sailing participants since Leg 101 through Leg 190.

Status of the Labstack

Post dry dock:

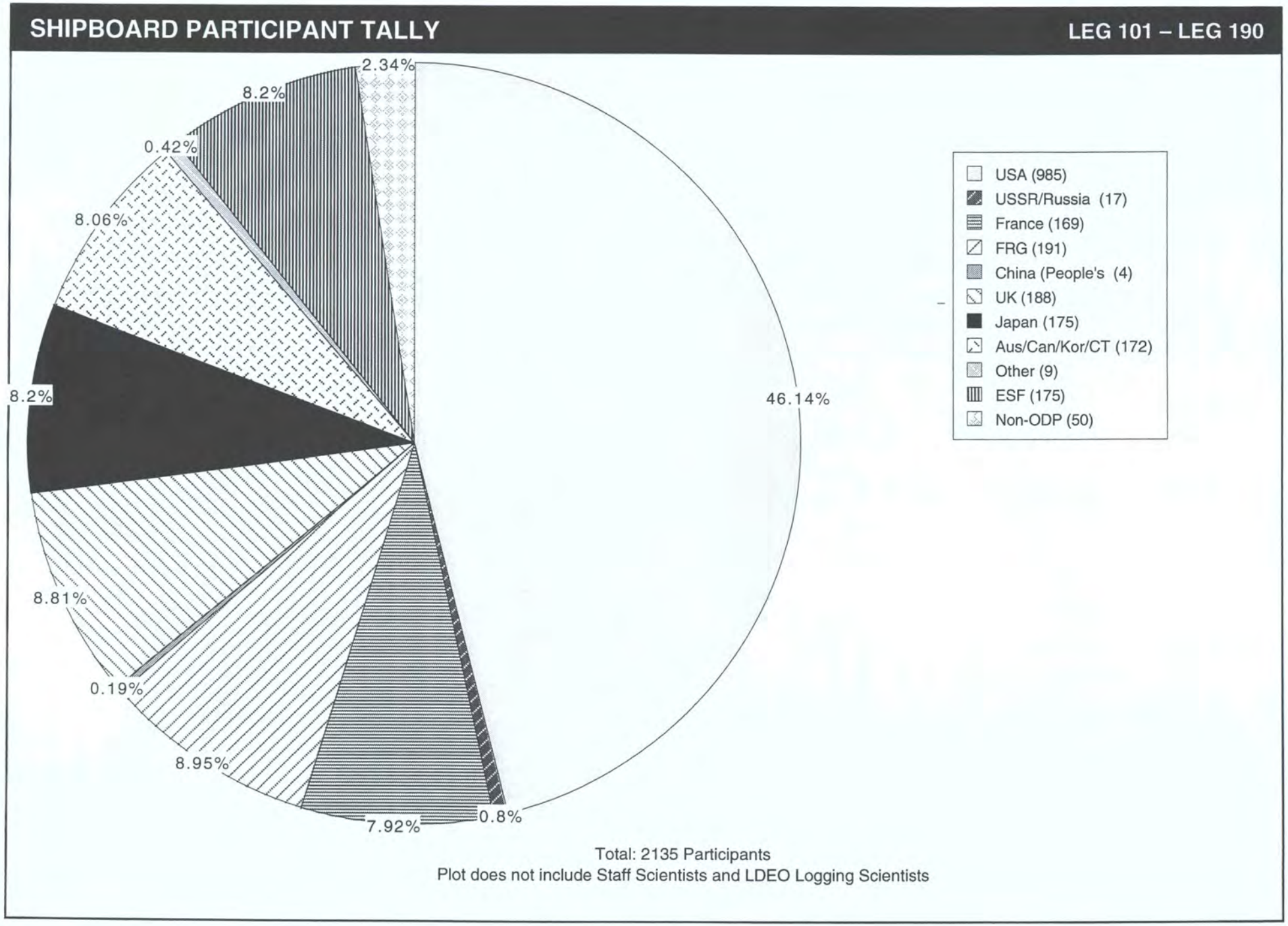
The two major labstack projects carried out during dry dock were (1) the addition of a new level to the top of the labstack, and (2) the core lab was remodeled to improve core flow and better control of processing of gassy cores. Activities associated with installation of the new level precluded any work in the core lab until late in the yard period. As a result, much of the transit from Singapore to Fremantle, and much of Leg 187, was devoted to completing the lab modifications and reinstalling and testing equipment. The labstack is now once again fully functional, and comments from the science parties on Legs 187-189 indicate that the lab modifications and the addition of a new level represent significant improvements.

Microbiology:

At its January meeting in Fremantle, SCIMP recommended that the XRF be removed *from JOIDES Resolution*, and the XRD and thin section making facilities be moved from their location on the 5th level to space on the new 7th level of the lab stack. The space on the 5th level vacated by these changes could then be used for the microbiology lab, which presently occupies space on the 7th level. These changes will put microbiology, geochemistry and micropaleontology labs in proximity, thus fostering synergy between the different groups of scientists, and from a practical point of view will allow for more efficient arrangement of utilities such as gas distribution and exhaust lines.

SCIMP further recommended that these changes be made during the transit between Legs 189 and 190. Further review by ODP/TAMU revealed potential risks to the Leg 190 science program, which includes a significant microbiology component, should the lab changes not be completed and the labs be restored to full functionality before the beginning of that leg. There were also concerns expressed regarding the feasibility/desirability of relocating the XRD to the top level of the Lab stack. The current strategy is to leave the XRD on the 5th level, and move all XRD and ICP sample preparation to the 7th level (along with the thin section making facilities). This simplifies and reduces the cost of making the lab changes, and alleviates concerns regarding the sensitivity of the XRD to relocation and ship motion. (If it is subsequently determined that the XRD interferes with microbiology needs, it can be relocated to the 7th level at a future time.)

TABLE 1


SHIPBOARD PARTICIPANT TALLY
LEG 101 – LEG 190
2.34%
8.2%
0.42%
8.06%
8.2%
8.81%
0.19%
8.95%
7.92%
0.8%
46.14%
USA (985)
USSR/Russia (17)
France (169)
FRG (191)
China (People's (4)
UK (188)
Japan (175)
Aus/Can/Kor/CT (172)
Other (9)
ESF (175)
Non-ODP (50)
Total: 2135 Participants
Plot does not include Staff Scientists and LDEO Logging Scientists

The current schedule calls for the XRF to be removed from the ship during the Yokohama port call at the beginning of Leg 191 and returned to ODP/TAMU in working order. The lab changes will be completed during the second half of Leg 191. Required materials have been ordered and will be shipped to Yokohama.

A substantial amount of equipment for microbiology studies has been purchased by Woods Hole Oceanographic Institution under a separate grant from the NSF LexEn Program. This equipment was placed on the ship at the Townsville port call and temporarily installed in lab space in the new 7th level. This equipment will be relocated when the lab changes are made during Leg 191.

Status of Projects

Digital Imaging:

A digital imaging system that can be used routinely to collect images of cores on the *JOIDES Resolution* has been a high priority issue for several years. At the June 1999 SCIMP meeting, a resolution was passed recommending that ODP-TAMU immediately purchase a complete commercially available RGB line scan digital imaging system and that the new system should be fully functional by July 2000. SCICOM approved this recommendation in August 1999. There were, however, no funds allocated for the acquisition of a digital camera in the FY00 ODP Program Plan and it was understood that this project was dependent on the reprogramming of savings in FY00.

Internal review at ODP-TAMU by a digital imaging working group resulted in a detailed list of technical specifications that are needed for such a system. An RFQ was submitted in early March, 2000, to vendors of digital core imaging systems so that ODP-TAMU could identify which commercially available RGB line scan digital imaging system should be purchased for use on the *JOIDES Resolution*. In the RFQ, we specifically requested prices and descriptions of two different types (configurations) of systems that we were considering. The first type is one in which only one section of core can be imaged at a time. The second type is one in which all sections of core are laid out side by side and the camera and illumination move along an x-y track to scan the sections sequentially without an operator having to intervene after each section. The ODP-TAMU working group felt that for reasons of efficiency of core flow, the second type of system was preferable; however, only one of four vendors of imaging systems actually makes a system like this, so this type of system would represent a new development for most vendors. In addition, the cost of such a system was unknown at the time we formulated the RFQ.

ODP-TAMU received responses from three vendors as of the closing date for the RFQ. Review of the responses to the RFQ was ongoing as of early May 2000. However, because of budget problems created by the high price of fuel for the ship it is unlikely that funds will be available to purchase the system in FY00. We will reexamine the budget for the last quarter of the fiscal year in July to see if funds for the digital imaging system can be made available. If not, then the project will have to be delayed until funds become available.

ICP Analyzer:

A JY2000 model inductively coupled plasma analyzer (ICP) was purchased in July, 1999, by the U.S. Department of Energy and made available to ODP. The instrument arrived at ODP/TAMU from France in mid September and was temporarily set up in the lab in College Station for training sessions for ODP technical support staff and staff scientists. The instrument was then shipped to Fremantle and installed in the chemistry lab at the beginning of Leg 187.

After some initial "teething troubles", the ICP was used successfully (though still in trial mode) on Leg 187 for rapid elemental analysis of basalt cores. As a result of work on the transit from Sydney to Guam via Townsville (Leg 190T), and building on the contributions of scientists and technicians during Legs 187, 188, and 189, we have now completed sample preparation and analytical protocols for routine analysis of both interstitial waters and basalts by ICP. Data reduction software for both types of analysis has been written and tested, and our technical staff has been trained in data transfer and manipulation. JANUS upload software for interstitial waters is complete, and we have outlined the data model for uploading and downloading major and trace element data from bulk rock analysis. A new technical note for ICP analysis on board the *JOIDES Resolution* has been written and is in final review before publication on the world wide web.

Drilling Services

Summary of Leg Operation: Legs 187, 188, 189

	Leg 187 **Australia-Antarctic** **15 Nov - 12 Jan '00** **Fremantle - Fremantle**	**Leg 188** **Prydz Bay** **12 Jan - 11 Mar '00** **Fremantle - Hobart**	**Leg 189** **Southern Gateways** **11 Mar - 13 May '00** **Hobart -Sydney-Townsville**
Transit/Onsite (day)	15 / 38	25 / 31	10 / 49
Sites	13	3	5
Holes	23	7	16
Water Depth (m)	4365 - 5747	480 - 3549	2159-3579
Deepest Penetr. (m)	407.3	999.1	958.8
Cored Interval (m)	616.7	1852.1	5116.8
Tot. Recov. (m, %)	137.3 m (22.6%)	971.1 m (52.4%)	4539.1 (88.7%)
APC Recov. (m, %)	0 (0%)	167.9 (86.8%)	1980.0 (100.3%)
XCB Recov. (m, %)	0 (0%)	462.8 (49.1%)	1508.9 (84.9%)
RCB Recov. (m, %)	137.3 (22.6%)	340.3 (47.5%)	1050.2 (77.0%)

Review of Operations

Leg 187 (Australia-Antarctic Discordance):

- Drilled 3789.8 m sediment (an average 165 m per site) without coring.
- Cored 616.7 m of basaltic basement in single bit RCB holes.
- Initial testing of the Active Heave Compensator.
- Commissioning leg for Rig Instrumentation System.

Leg 188 (Prydz Bay):

- Core recovery was highly variable in the glaciomarine sediments (52.4% overall) with 971 m recovered.
- Ice and weather caused 7.1 days of lost time, due to cold temperatures: (e.g., static – 7.5°C, with wind chill –28.0°C), ice/freezing problems, and/or icebergs.
- 2 Measurement While Drilling holes were drilled providing real time data transmission of drilling parameters with data recorded on the new Rig Instrumentation System.
- Active Heave Compensation system was not operational due to servo-valve failure during commissioning.
- Logging While Drilling provided logs in holes that could not be logged w/ wireline tools.
- First high latitude leg completed without an ice picket boat.

Leg 189 (Southern Gateways):

- High seas with ship heave in excess of 15 ft.
- On inbound transit ending Leg 189, stopped 1 day in Sydney to discharge science party and take on fuel. Then finished transit to Townsville, arriving 11 May 2000.
- Commissioning and acceptance leg for Active Heave Compensations system initiated on Leg 189; to be completed on Leg 190.
- Training for drill crew of the new Active Heave Compensation system; the other crew will be trained on Leg 190.

Review of Engineering Development Projects

The last six months have been very active for engineering development. Two major projects that were initiated at dry dock, Active Heave Compensation (AHC) and Rig Instrumentation, were successfully installed and are now operational. Two other developments, Hard Rock Reentry System (HRRS) and Advanced Diamond Core Barrel, have undergone quarry tests and are being prepared for testing on board the *JOIDES Resolution* later in FY00. Moreover, work continued on a long term project to improve the Program's downhole measurement tools.

Active Heave Compensator (AHC)

The largest of the projects that ODP carried out at dry dock was the conversion of the ship's passive heave compensator to an activated hydraulic system called AHC. The objective of the AHC project was to reduce the ship's heave being transmitted to the drill string to low, managed values to reduce large weight on bit fluctuations. The vertical motion transmitted to the drill string by ship heave produces cyclic disturbance and wide weight-on-bit fluctuations. Although this project had been recommended by TEDCOM in December of 1996 and approved by SCICOM in the Spring of 1997, the implementation of the project had been delayed first by budgetary constraints in FY98 and then further delayed because the vendor originally chosen to provide the system failed to adequately address both technical and contractual concerns. The project was re-bid in the fall of 1998 and a contract was signed with Maritime Hydraulics (MH) April 1, 1999. Although AHC systems are now standard technical equipment on deep water platforms and ships in the oil industry, each installation is unique and has to be specially designed to fit the requirements of each platform or vessel. With the contract being signed on April 1, 1999, MH and ODP were faced with a very compressed schedule to design, review, approve and develop technical specifications for the AHC. Indeed, although MH engineers visited the ship on several occasions prior to the installation to take measurements and to determine design and installation details, they failed to adequately account for conflicts in the derrick with hydraulic hoses, hydraulic cylinders and the optimal positioning of hydraulic pipes. These problems were all ultimately resolved, but they did result in delays in project development and increased costs. Because problems with the hydraulic hoses and piping were not fully understood until the end of dry dock, the AHC was not functional when the ship left Singapore. The necessary modifications were made while the JR was in transit to Fremantle and the re-configured hydraulic hoses and piping were installed at the Fremantle port call prior to Leg 187. The AHC was tested at the start of Leg 187 in shallow water and initial tests verified that the AHC provided significant improvement in reducing bit motion over the passive mode. (The tests showed that the AHC was holding the hook load variation to 2K with vessel heave of 8-10 ft. peak to peak. In comparison, the passive mode hook load variation was 10K). During Leg 187, it was established that the Motion Reference Unit (MRU) for the AHC had not been properly calibrated by the manufacturer, causing faulty heave feedback. This was a manufacturing problem, and could not be rectified at sea. The AHC was turned off for the remainder of Leg 187. At the Leg 188 port call, the MRU was replaced and modifications were made to the AHC to streamline operations by further reducing hydraulic conflicts. During testing of the AHC prior to sailing, the servo valve, which controls hydraulic flow to the active heave cylinders, failed to control flow of hydraulic fluid rendering the AHC inoperable. The problem could only be fixed by the manufacturer and the AHC did not operate during Leg 188. At the Leg 189 port call, a new servo valve was installed and dockside tests established the AHC was functional.

On Leg 189 the AHC was operational during the leg at all sites and data was collected by the new rig instrumentation system on ship and drill string dynamics. These digital data allow analysis of AHC performance and a preliminary review of these data document the performance of the AHC system (i.e., the system's ability to decouple ship's heave from the drill string). An example of these data from Hole 1168A shows the following results when the Passive Heave Compensator (PHC) performance is compared with the performance of the AHC under similar conditions.

	Ship's Vertical Velocity (ft/sec)	Ship's Heave Extreme (ft)	Ship's Heave Average (ft)	Drill String Motion Extreme (ft)	Drill String Motion Average (ft)	Drill String Torque (ft-lbf)	Efficiency Percentage
PHC	1-3	10	4-6	8.0	2 to 4	2000-5000	40-85
AHC	1-4	8-10	4-6	0.67	0.33	2500-3500	98-104

Based on these data, the AHC is performing above 90% efficiency as designed. The PHC data also demonstrates that the drill string dynamics vary significantly suggesting that the bit may be lifted off-bottom and then dropped onto the bottom of the borehole. Such large variations in pipe dynamics should impact core quality and recovery depending on the material being cored. On Leg 189, however, there was no demonstratable difference in the quality of core recovered when the AHC was used vs. when the PHC was in operation. There are at least two reasons why no significant differences in core quality were observed. First, except for a limestone horizon cored at the last site, the lithology of the material cored was cohesive, but not well consolidated and rates of penetration were relatively high and cores were cut quickly with both the XCB and RCB. Under these conditions, the benefits of the AHC may not be clearly defined. Second, the AHC could not be operated continuously at any of the sites because the seas were large enough that the heave of the ship exceeded the stroke of the compensator pistons. Now that the ship is leaving the Southern Ocean, we will be able to use the AHC under more favorable environmental conditions allowing AHC usage for the duration of XCB and RCB operations. Moreover, during the next year we will be operating under a wide range of geologic conditions.

It is important to note that the more consistent torque exhibited during AHC operations on Leg 189 can be directly related to more constant weight imposed on the bit and is the result of reduced motion of the drill string at the surface. There is an intent to actually measure weight on bit variations with a Measurement While Coring system that could be used in conjunction with the use of Logging While Drilling on an upcoming leg. Leg 193 (Manus Basin) is being targeted and this option will be explored with JOI, JOIDES and LDEO. All these data can be fed into, and recorded by, the new Ryan Rig Instrumentation System (RIS) that was installed at dry dock.

The AHC system has two criteria that limit operations:

- The ship's vertical velocity in response to heave does not exceed 4 ft/sec; and
- The PHC stroke for safe operations is limited to ± 2.5 meters (±8 ft).

Unfortunately, on Leg 189 the weather associated with the Fall season in the Southern Ocean resulted in long periods of time when the AHC was turned off because operational limits were exceeded. Initial testing of the AHC for commissioning was carried out at the first site during Leg 189 when the MH engineer was on board and final commissioning tests will be run during the first portion of Leg 190. We anticipate that the system will be accepted at that time and we look forward to using the AHC under more favorable sea state conditions.

The performance data obtained during Leg 189 indicate that the AHC is performing up to specifications (i.e., the drill pipe motion is less than 10% of the measured ship's vertical motion or heave). In fact, analysis of data from Leg 189 (see table) indicates reduction of drill pipe motion exceeds 95% of the ship's vertical motion. Please note that the AHC sometimes over compensates

(100-104% compensation), but this is viewed as a tuning problem that should be solved on Leg 190. There are, however, two operational problems that have been identified that will be dealt with during the next several months. First, the bundle of hydraulic lines in the derrick, that ride up and down as the drill string is compensated, is not as well contained as we would like given the harsh conditions that we sometimes experience. The drill crews are presently considering options that will minimize the motion of the hydraulic lines when the ship is experiencing heavy seas. Second, operation of the AHC has shown that the Martin-Decker gauge that measures hook load, a surface parameter that is a proxy for weight on bit, exhibits very large variations when the AHC is activated. This condition makes it difficult for the driller to control the weight applied to the drill string. The pneumatic properties of the PHC has a very soft spring constant that is approximately 10% of the spring constant of the drill string. As a consequence, the PHC attenuates the variations in hook load that the hydraulic load cells presently measure and that are displayed on the Martin-Decker gauge. The AHC system overrides the dampening effect of the PHC system and directly exposes the Martin-Decker gauge to the spring factor of the drill string resulting in large fluctuations as the AHC system compensates for the ship's heave. Moreover, the rapid (20m/sec) response of the AHC is another factor that contributes to excessive needle bounce. The problem will be minimized with the installation of electronic load pins on Leg 190. The load pins will sense the drill string weight below the PHC and above the Top Drive. Moreover, the load pin data is digital and the variations imposed by the fast response of the AHC can be filtered out creating a smoothed data stream. This problem should be resolved in the next several months.

Finally, the new AHC system requires the driller to operate the rig in a conventional land-rig drilling mode. The driller initiates drilling with the AHC after centering the PHC at mid-stroke. The driller will have to lower the blocks with the draw works to maintain weight on bit instead of bleeding air from the PHC system. This will require training and practice by the driller. This transition to a new way of drilling should be relatively easy once the new load pins are installed and the driller has a measurement of hook load that does not fluctuate wildly.

Rig Instrumentation System

During dry dock a Rig Instrumentation System (RIS) was installed on the *JOIDES Resolution*. This system represented a conversion of the 25 year old analogue instruments that displayed salient drilling parameters (e.g., hook load, rate of penetration, torque, revolutions per minute, depth, depth below seafloor) on charts and/or dials in the operations shack to a digital system that permitted more accurate readings and a continuous data stream that could be displayed at key locations throughout the ship and recorded for later analysis and integration into drilling results. The ability to present RIS data in formats that graphically display the drilling conditions bolsters interpretation and decision making. The data export feature allows scientists to merge and correlate drilling data with the physical properties data of recovered core. This type of analysis enables investigators to assess formation properties over cored segments where recovery is poor. These data recording and post processing features of RIS also provide operations and development engineers with the tools to analyze bit and bottom hole assembly performance, as well as downhole tool operation. This wealth of information coupled with the analytical abilities of the RIS will shorten design cycles, which will accelerate the deployment of new and improved drilling systems. Commissioning of the RIS was carried out during Legs 187 and 188. All hardware, electronic systems and software are

functioning as specified. Procedures and methods for data archiving, distribution to the science community, and engineering analysis are being prepared.

The installation of a data acquisition and recording system is the foundation of a plan for achieving more science, smarter drilling and quicker development of new coring tools. The openness of the RIS architecture will allow ODP to move forward on Measurement while Drilling (MWD) type tools as was demonstrated on Leg 188. The ability to acquire, record and merge data from practically any measurement device (downhole or surface or laboratory) significantly augments scientific and engineering analysis. The recent installation of instrumented load pins to measure hook load is an example of the operational improvements, which can be added to the RIS system. Other such incremental enhancements will become evident as familiarization of the system progresses.

Advanced Diamond Core Barrel (ADCB) Project

The scientific goal of the ADCB is to improve core recovery in fractured hard rock.

The ADCB project enhances the existing diamond core barrel (DCB) by cutting a larger core while maintaining the use of a smaller (6 ¾-in) bottom hole assembly (BHA). The project's operational strategy is to adapt existing mining technology's thin kerf concept and to utilize as much "off the shelf" hardware as possible. The thinner kerf bits result in less rock being removed and, in turn, reduce the amount of potential disturbance that the formation sees while coring.

To date, the ADCB has been built and land tested once in May 1999. The results were very encouraging with 96% of hard and fractured rock recovered from 150 ft of coring. Another land test is planned in early June 2000 to further enhance the operating characteristics of all the additional hardware and components that have been designed to be run with the ADCB. This "stack- up" test will allow the shock sub, circulation, new positive indicator latch, as well as the triple tube coring system (i.e. split steel liners) all to be operated as one integrated system. Upon the successful completion of this "stack-up" test the hardware will be prepared and shipped for its initial use during Leg 193.

The ADCB project has been a collaborative project with JAMSTEC and the Japanese Drilling Company (JDC).

Hard Rock Reentry System (HRRS) Project

The scientific goal of the HRRS is the development of a reentry system for unstable surface formations of fractured hard rock and pillow basalt.

The objective is to develop a system that permits the emplacement of a reentry funnel and surface casing on the seafloor where conventional casing, hard rock guide bases, or reentry cones could not be used or are not applicable. The HRRS project has developed a drill in casing system using new fluid hammer technology in place of the conventional percussion air hammers that are used in land-based operations.

Plans and hardware are in place to deploy the HRRS during Leg 191 at Shatsky Rise. Four new types of bits have been developed over the last two years that are more robust than the bits used on Leg 179. The bits have been redesigned for improved spudding on bare rock. Ring bits have also been developed and land tested for the drilling in of 13 3/8-in casing with the hydraulic hammer, in addition to the improved under-reamer style.

The future of the HRRS project is dependent upon the level of funding that is available through the end of the program. Science has expressed a need for such hardware and a successful test on Leg 191 will call for its continued use on challenging hard rock legs. Casing equipment, bits and hammer rental would have to be covered via leg special operating expenses for future ODP legs.

Downhole Measurement Technology

The scientific and engineering objective of the Downhole Measurement Technology project is to provide centralized support for ODP/TAMU downhole measurement tools, as well as to develop and acquire new measurement tools for improved science. A major part of this effort is to create a commonality in data acquisition and support software for all downhole measurement tools. This will be applied to current operational tools, third party tools and future tools. A service center has been set up to provide centralized documentation control, inventory control, technical support, and orderly implementation of upgrades and changes. Initially, the five tools being included in this project are the APC Temperature tool, the WSTP, the DVTP, a new APC Methane tool developed in colaboration with scientists at the Monteray Bay Aquarium Research Institute and the Memory Drilling Sensor Sub.

The Service Center is well established and the task of standardizing hardware, software and calibration procedures for current downhole measurement tools is underway. The DOS based communication and analysis software for the DVTP tool has been rewritten in LabView for Windows. This will be duplicated for the APC Temperature tool and WSTP. A pore pressure measurement was added to the standard DVTP tool, and after successful sea trials the remaining tools will be upgraded. Downhole Data Acquisition System (DAS) electronics is being developed for the APC Methane tool and will be adapted to the APC Temperature tool, WSTP and DVTP. Vendor discussions are underway for procurement of a downhole Drilling Sensor Sub (DSS).

Information Services

Status of Janus Database

Last December a JANUS review committee met to identify and prioritize tasks which were to be completed. This review was instituted to make the JANUS data storage/retrieval applications more usable and responsive to the needs of the scientific community in accomplishing the goals of the Ocean Drilling Program.

The information in the tables below indicate the work currently underway and tasks which have already been completed since the results of the committee were finalized in January 2000. It should be noted that the items below marked with an '*' are taken from the list produced by the committee

and were indicated as the ones which should be worked on first. As each item in the 'Tasks in Progress' table are completed, the next higher priority task(s) will be assigned based on available resources.

Tasks Completed	Area
* Reformat Gas Element Table	Chemistry
* Reformat Gas Element Graphs	Chemistry
* Section Breaks in Net Query	PMag
* IW Data Upload on PC	Chemistry
* Carbonate Data Upload on PC	Chemistry
* Fix/Create Splice Reports	Misc. Labs
* Implement updated MAD application	Phys. Props.
* Fix Slider Entry and Bugs	Core Desc.
Generic Data Uploader	All
BOL/EOL Synchronizer	IS

Tasks in Progress	Area	Phase	Target Leg
* ICP Data Model; Upload; Data Retrieval	Chemistry	Analysis	TBD
* Down Hole Temperature Collection	Downhole	Analysis	TBD
* Scope of work for Bar Code implementation	All	Analysis	190
* AppleCore Sedimentary Data Uploader	Core Desc.	User Testing	190
* Fix AppleCore Batch Export	Core Desc.	User Testing	190
* Age-Depth Control Points	Misc. Labs	Development	TBD
* Implement JRS (JAVA version) on ship	Curation	User Testing	192
* Fix Slider Entry and Bugs	Core Desc.	Development	TBD
* Create Net Query for Zplot	Pmag	User Testing	190
* MAD Control Measurements	Phys. Props.	User Testing	190
* Correct Gas Upload	Chemistry	User Testing	190
Generic Editor for all of JANUS data	All	Analysis	TBD

Migration of Historical ODP Data into the Janus Database

A long term goal of the Program has been the migration of the historical digital data collected on the ship into the Janus relational database. The data migration project was started in September 1998, but progress of the project has been limited because the Program has devoted just one FTE to this endeavor. Moreover, progress has not been steady because we have experienced turnover in this position because of the marketability of an individual who has advanced degrees in both geological and computer sciences. We lost an experienced FTE in August of 1999 and the position was filled in April 2000 when Dr. Golam Sakar joined ODP. Progress in data migration is now expected to accelerate. To date, all the MST data (i.e., GRAPE, P-wave, Magnetic Susceptibility, Natural Gamma Radiation and Color Reflectance) has been migrated from Legs 155 to 170. Now that the formats, process and structure of data migration are in place, we anticipate that the migration of the MST data from Leg 101-155 will be completed by August 2001.

MST and Color Reflectance Data Migration:

Start Date: September 1998
Current: May 2000
Target Completion Date: August 2001

Leg / Data	170	169	168	167	166	165	164	163	162	161	160	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145
GRAPE	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						o			
P-Wave	x	x	x	x	x	x	x	o	x	x	x	x	x	x	x	x		o					o			
MagSus	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						o			
NGR	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	o				1				
Color Reflectance	x	x	x	o	x	x	x	o	o	x	x	x	o	x	x	o	x	2								

Leg / Data	144	143	142	141	140	##	138	137	136	135	134	133	132	131	130	129	128	127	126	125	124	123	122	121	120	119
GRAPE			o		o							x														
P-Wave			o		o							x														
MagSus			o		o							x														
NGR																										
Color Reflectance																										

Leg / Data	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103	102	101
GRAPE	o									o			o				o	
P-Wave	o								o	o		o	o	o	o	o	o	o
MagSus						o				o	o					o	o	o
NGR																		1
Color Reflectance																		2

Legend:

- x Migration to Janus database completed
- o Data not acquired by ODP
- 1 NGR acquisition started Leg 150
- 2 Reflectance acquisition started Leg 154

Publication Services

New *Scientific Results* Volume Format Development

The year 2000 marks the beginning of a new level of electronic publishing for ODP. As reported in the last Publication Services report (December 1999), beginning with *Scientific Results* (SR) Volume 169, all *Proceedings* volumes will be published on the World Wide Web chapter by chapter in the order of acceptance in both HTML and PDF formats. On 15 April 2000, the first SR paper for Leg 169 was published on the World Wide Web and two more papers were published on 12 May 2000 and 15 May 2000 (see list below for titles). Seven additional Leg 169 titles are now in press.

Leg 169 *Scientific Results* papers that have published on the Web as of 20 May 2000:
<http://www-odp.tamu.edu/publications/169_SR/169TOC.HTM>

1. Data Report: Trace Element Geochemistry of I^-, Br^-, F^-, HPO_4^{2-}, Ba^{2+}, and Mn^{2+} in Pore Waters of Escanaba Trough, Sites 1037 and 1038
   Joris M. Gieskes, Chris Mahn, and Barni Schnetzger
2. Bacterial Profiles in a Sulfide Mound (Site 1035) and an Area of Active Fluid Venting (Site 1036) in Hot Hydrothermal Sediments from Middle Valley (Northeast Pacific)
   B.A. Cragg, M. Summit, and R.J. Parkes
3. Phospholipid Fatty Acid–Derived Microbial Biomass and Community Dynamics in Hot, Hydrothermally Influenced Sediments from Middle Valley, Juan De Fuca Ridge
   Melanie Summit, Aaron Peacock, David Ringelberg, David C. White, and John A. Baross

This summer, the Leg 169 Co-chiefs will write a postcruise synthesis paper that will be printed in the first SR booklet. All of the Leg 169 papers that have been published on the Web by August 2000 will be reprinted in PDF on the volume CD, which will accompany the SR booklet. Publication of *Scientific Results* volumes will follow this format for Legs 170 and beyond. A total of 21 papers are currently in press for volumes 169–172 (169: 7; 170: 2; 171A: 2; 171B: 6; 172: 4).

ODP is also maintaining a Web-based list of leg-related citations that will include papers from *Initial Reports* and *Scientific Results* volumes, as well as meeting abstracts and citations from books or journal publications. For more information, see the "Web Development: Leg-related Citations" section below.

Volume Production

From January through June 2000, the following *ODP Proceedings* volumes were produced and distributed:

Initial Reports
Booklet/CD-ROM: 182 (Feb 2000), 183 (Mar 2000), 184 (Apr 2000)
Web (PDF and HTML): 180 (4 Feb 2000), 181 (12 May 2000), 182* (anticipated 26 May 2000), 183* (anticipated 29 May 2000)

Scientific Results
Booklet/CD-ROM: 164 (Jan 2000), 165 (Feb 2000), 166 (May 2000)
Web (PDF and HTML): 164* (19 May 2000), 165* (26 May 2000), 166* (29 May 2000), 169 (first chapter on-line 15 April 2000)

*PDF and/or ASCII versions of all materials published in printed volumes and on the volume CD-ROMs are currently available on the Web; HTML versions of chapters will be available as soon as the material is formatted.

From July through December 2000, the following *ODP Proceedings* volumes are expected to be produced and distributed:

Initial Reports
Booklet and CD-ROM (PDF version): 185, 186
WWW (PDF and HTML versions): 184, 185, 186

Scientific Results
Book and CD-ROM (PDF version): 167, 168
Booklet and CD-ROM (PDF version): 169, 170
WWW (PDF and HTML versions): 167, 168, and individual papers for Volumes 169 and beyond

ODP Proceedings Distribution

The Department has sold DSDP and ODP volumes for a cumulative revenue of $17,560 between December 1999 and April 2000. This revenue is budgeted annually and supports a portion of the cost of publishing new volumes.

The Department has continued to distribute free sets of volumes to academic institutions that do not already have accessible sets of DSDP and ODP volumes (institutions pay shipping costs). Between December 1999 and May 2000, 3 institutions (Brunel University, UK; Florida State University, USA; University of Maine, USA) were sent 296 ODP and 91 DSDP volumes (UK = 140 ODP volumes and 74 DSDP volumes; USA = 156 ODP volumes, 17 DSDP volumes). Total value for the books in these shipments equals $20,567.

SCIMP Recommendations

Citation of Preliminary Report (Rec. 99-2-2):

Beginning with Leg 187, all Preliminary Reports contain the following note:

> "This report was prepared from shipboard files by scientists who participated in the cruise. The report was assembled under time constraints and does not contain all works and findings that will appear in the *Initial Reports* of the *ODP Proceedings*. Reference to this report should be made as follows:
>
> > Shipboard Scientific Party, 2000. Leg 187 Preliminary Report: Mantle Reservoirs and Migration Associated with Australian Antarctic Rifting. *ODP Prelim. Rpt.,* 87 [Online]. Available from World Wide Web: <http://wwwodp.tamu.edu/publications/prelim/187_prel/187prel.pdf>. [Cited YYYY-MM-DD]."

WWW Development

ODP/TAMU Web Pages:

The State of Texas has adopted a new rule that affects state web sites, including web sites at state universities. The new rule applies primarily to "key public entry points" and requires implementation of certain standards pertaining to the accessibility of state web sites, indexing of web pages, information security, and protection of citizens' privacy. The deadline for compliance is 1 July 2000.

Texas A&M University has interpreted "key public entry points" to mean the main university web page and departmental web pages such as the ODP/TAMU homepage. In most cases, the rule goes into effect when new web sites are developed or existing sites are changed. To comply with this rule

ODP/TAMU has made its homepage compliant with the accessibility, indexing, and privacy standards. As time allows, given our existing personnel and budgetary constraints, we plan to apply these standards to lower level pages that provide important information to the scientific and public community. For example, we plan to use encrytpion on electronic forms that solicit private information such as passport or Social Security numbers.

Mirror Sites:

The Publication Services and Information Services Departments continued to work on the establishment of Web mirror sites in Australia, the United Kingdom, and Germany. Current status of these mirror sites is as follows:

Australian Geological Survey Organisation (Canberra , Australia; http://www.agso.gov.au/odp): functional; the site is updated regularly; does not mirror Janus database.

Natural History Museum (London, UK): site is being configured now; there are some firewall issues that have to be resolved in England before it can be opened; the site should be on-line this summer.

Universität Bremen (Bremen, Germany): purchased a larger system capable of mirroring the entire ODP/TAMU web site (including ODP Publications and the Janus database); system is just coming on-line now; ODP/TAMU has shipped a set of tapes for installation of the Publication files and when those are on-line, Bremen will install the mirroring software to pick up all further updates and new files; the site should be on-line this summer; however, at this time ODP/TAMU does not know the schedule for the mirroring the Janus database.

ODP/TAMU Web User Statistics:

ODP/TAMU Main Entry Points

	May 99	June 99	July 99	Aug 99	Sept 99	Oct 99	Nov 99	Dec 99	Jan 00	Feb 00	Mar 00	Apr 00
ODP/TAMU site* (www-odp.tamu.edu)	19,328	20,188	20,372	18,993	24,354	25,714	24,069	24,309	26,021	33,162	40,643	29,790
ODP/TAMU main page	5,696	4,921	4,173	4,114	5,144	5,473	5,622	4,651	5,900	6,492	6,649	5,271
Publications main page	836	938	838	953	1,057	1,157	1,211	973	1,166	1,311	1,380	1,133
Janus database* (janusaxp.tamu.edu)	510	632	611	572	637	876	948	866	982	1,186	1,180	891

Notes: Numbers represent single-user sessions that originate outside ODP. Each user session results in multiple page views and/or database requests. * = Janus database sessions are in addition to those given for the "ODP/TAMU site."

Initial Reports* Volumes

Volume	May 99	June 99	July 99	Aug 99	Sept 99	Oct 99	Nov 99	Dec 99	Jan 00	Feb 00	Mar 00	Apr 00	Web Publication Date
166†	15	21	30	22	20	31	32	41	34	27	44	44	1 Oct 1997
167†	16	24	25	24	–	27	27	20	37	37	36	29	13 Feb 1998
168†	11	12	23	21	24	29	23	19	33	22	26	19	23 Feb 1998
169†	10	15	19	14	21	66	39	33	37	41	39	29	17 Apr 1998
169S†	12	6	18	17	19	19	14	19	25	32	18	16	10 Apr 1998
170†	13	15	17	17	17	18	20	25	27	25	21	23	24 Apr 1998
171A†	9	19	14	18	19	20	22	18	23	23	20	16	26 June 1998
171B†	8	19	19	27	22	15	31	20	31	31	31	24	26 June 1998
172†	12	15	22	18	13	25	18	19	36	29	26	26	31 July 1998
173†	–	14	21	17	18	23	22	19	29	16	18	22	4 Sept 1998
174A†	11	20	16	19	14	18	36	14	21	22	17	25	31 Dec 1998
174B†	5	10	12	14	10	14	17	20	16	16	12	13	31 Dec 1998

174AX†	9	8	11	15	9	12	20	11	25	16	12	14	31 Dec 1998
174AXS**							8	21	32	27	18	17	28 Dec 1999
175†	22	42	31	39	14	27	22	27	29	28	35	25	9 Feb 1999
176**		4	37	18	15	26	25	20	18	13	19	25	30 June 1999
177**		45	59	51	28	29	50	26	33	40	30	24	28 May 1999
178**				42	46	43	29	31	37	39	37	26	31 Aug 1999
179**			33	13	9	28	36	44	37	36	18	30	23 July 1999
180**										38	63	44	4 Feb 2000

Notes: Numbers represent single-user sessions that originate outside ODP. Each user session results in multiple page views and/or database requests. * = numbers indicate hits to the entry page of each volume. † = volumes are only in PDF format. ** = volumes posted initially in PDF format and subsequently in HTML format.

Scientific Results Volumes*

Volume	May 99	June 99	July 99	Aug 99	Sept 99	Oct 99	Nov 99	Dec 99	Jan 00	Feb 00	Mar 00	Apr 00	Web Publication Date
150X†	22	20	31	30	24	34	58	42	63	61	63	57	7 Aug 1998
152†	34	31	34	46	31	65	98	65	75	87	76	64	8 July 1998
154†	34	55	39	62	54	63	93	65	82	78	78	80	1 Oct 1997
155†	41	50	32	43	60	65	86	72	101	80	103	66	15 May 1998
156†	28	34	37	36	33	51	59	46	64	55	70	53	21 Aug 1998
157†	27	31	36	32	37	51	98	70	80	79	75	64	14 Aug 1998
158†	27	50	26	34	35	59	66	65	68	65	77	52	15 May 1998
159†	24	24	35	21	22	39	96	73	82	65	62	46	31 Dec 1998
159T†	13	25	13	22	11	24	30	15	26	19	22	20	31 Dec 1998
160†	9	54	56	66	86	79	144	124	118	131	145	97	9 Nov 1998
161†	54	71	39	58	59	79	86	88	88	98	80	68	19 Mar 1999
162**				78	53	52	50	44	47	46	58	37	20 Aug 1999
163**					60	48	62	38	68	63	60	51	19 Sept 1999
169††												25	15 April 2000

Notes: Numbers represent single-user sessions that originate outside ODP. Each user session results in multiple age views and/or database requests. * = numbers indicate hits to the entry page of each volume. † = volumes are only in PDF format. ** = volumes posted initially in PDF format and subsequently in HTML format. †† = volume will be published chapter by chapter in the order of acceptance in both PDF and HTML formats; date indicates when first paper was published.

Leg-related Citations

During Legs 160 through 175, authors were permitted to fulfill their ODP publication obligation by either submitting a manuscript to a peer-reviewed journal that is published in English, or by submitting a paper or data report to the *Scientific Results* (SR) volume. Beginning with Leg 176, authors are required to publish a paper in a journal or book, or a paper or data report in the SR volume. In addition, authors from Legs 160 and beyond are supposed to provide ODP/TAMU with copies of all citations from papers published in books or journals during the first 48 months postcruise. ODP/TAMU posts these citations on the Publications Web site (<http://www-odp.tamu.edu/publications/, click on "Leg-related Publications"; click on "Leg ###"; click on "Citations").

To date, the Publication Services Department has only received notification of 65 papers from 14 legs (see below). We do not believe this list is complete despite our efforts and those of the Staff Scientists to remind scientific party members to submit their citations after their papers have been accepted. Publication Services has cross checked the citations they have received with the reprints received by Curation. It has also sent reminders to Co-Chiefs and correspondence authors to remind them to submit this important information. The success of the leg-related citation lists is dependent upon authors remembering to fulfill their final obligation requirement and submitting all published citations to the ODP Publications Coordinator.

The Publication Services Department is tacking the number of papers that are projected and published based on ODP postcruise research. The following table summarizes recent tabulations.

Leg	SR Volume			Journal or Book			
	Projected*	Submitted	Published	Projected*	Submitted†	Published†	Citations on Web
160	62	54	54	0	2	2	2
161	47	46	44	6	6	6	5
162	24	23	20	32	10	10	22
163	22	16	15	4	8	5	1
164	35	41	43	18	17	5	5
165	26	24	20	2	11	6	5
166	28	18	17	7	10	9	4
167	40	33	32	11	12	8	2
168	17	13	14	47	21	9	4
169S	0	1	1	28	25	7	None received
169	14	9	10	29	28	7	4
170	6	4	June 00	15	17	1	1
171A	1	3	June 00	16	16	3	3
171B	15	9	19 June 00	43	28	5	5
172	8	15	14 Aug 00	36	9	—	None received
173	8	12		19	6	—	None received
174A, 174AX	8	8	20 Nov 00	17	5	—	None received
174B	1	2	11 Dec 00	5	1	—	None received
175	14	21	12 Feb 01	24	8	1	1
176	17	11	9 Apr 01	20	2	—	None received
177	7	12 June 00	11 June 01	34/10‡	12 June 00	—	None received
178	8	11 Aug 00	6 Aug 01	17/27‡	11 Aug 00	—	None received
179	21	9 Oct 00	8 Oct 01	15	9 Oct 00	—	None received
180	6	11 Dec 00	10 Dec 01	23/2‡	11 Dec 00	—	None received
181	—	12 Feb 01	11 Feb 02	NA	12 Feb 01	—	None received
182	June 00	9 Apr 01	8 Apr 02	June 00	9 Apr 01	—	None received
183	July 00	11 June 01	10 June 02	July 00	11 June 01	—	None received

Notes: Data updated in April 2000. * = count from table of contents prepared at second postcruise meeting. † = "published" and "submitted" counts reflect the number of papers authors have notified the ODP Publications Coordinator about. ‡ = numbers indicate papers proposed without a specific venue. — = no information.

Leg-Related Citations Posted on ODP Web Site, January 4 1999 to 17 May 2000

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Soto, J.I., and Platt, J.P., 1999. Petrological and structural evolution of high-grade metamorphic rocks from the floor of the Alboran Sea Basin, Western Mediterranean. *J. Petrol.*, 40:21-60.

Tandon, K., Lorenzo, J.M., and de La Linde Rubio, J., 1998. Timing of Rifting in the Alboran Sea Basin — correlation of borehole (ODP Leg 161 and Andalucia A-1) to seismic reflection data: implications for basin formation. *Mar. Geol.*, 144:275-294.

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Elverhøi, A., Norem, H., Andersen, E.S., Dowdeswell, J.A., Fossen, I., Haflidason, H., Kenyon, N.H., Laberg, J.S., King, E.L., Sejrup, H.P., Solheim, A., and Vorren, T.O., 1997. On the origin and flow behaviour of submarine slides on deep sea fans along the Norwegian-Barents Sea continental margin. *Geo-Mar. Lett.*, 17:119-125.

Elverhøi, A., Svendsen, J.I., Solheim, A., Andersen, E.S., Milliman, J., Mangerud, J., and Hooke, R.LeB., 1995. Late Quaternary sediment yield from the high Arctic Svalbard area. *J. Geol.*, 103:1-17.

Faleide, J.I., Solheim, A., Fiedler, A., Hjelstuen, B.O., Andersen, E.S., and Vanneste, K., 1996. Late Cenozoic evolution of the western Barents Sea-Svalbard continental margin. *Global Planet. Change*, 12:53-74.

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Bralower, T.J., Thomas, D.J., Zachos, J.C., Hirschmann, M.M., Röhl, U., Sigurdsson, H., Thomas, E., and Whitney, D.L., 1997. High-resolution records of the late Paleocene thermal maximum and circum-Caribbean volcanism: is there a causal link? *Geology*, 25:963-967.

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Major, C.O., Pirmez, C., Goldberg, D., and the Leg 166 Scientific Party, 1998. High-resolution core-log integration techniques: examples from the Ocean Drilling Program. *In* Harvey, P.K., and Lovell, M.A. (Eds), *Core-Log Integration*, Geol. Soc. Spec. Publ. London, 136:285-295.

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Davis, E., and Becker, K., 1998. Borehole observatories record driving forces for hydrothermal circulation in young oceanic crust. *Eos, Transactions*, 79:369,377-378.

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Huber, B.T., Leckie, R.M., Norris, R.D., Bralower, T.J., and CoBabe, E., 1999. Foraminiferal assemblage and stable isotopic change across the Cenomanian-Turonian boundary in the subtropical North Atlantic. *J. Foram. Res.*, 29: 392-417.

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Ravelo, A. C. and D. H. Andreasen, in press. Enhanced circulation during a warm period. *J. Geophys. Res.*

Public Information

During the last several months Public Information initiatives at ODP/TAMU have been focused on supporting the ODP Australian Secretariat druing the Leg 189 Hobart, Australia port call and finalizing a new ODP brochure on the JOIDES Resolution. Mr. Aaron Woods, head of Public Information at ODP/TAMU, resigned from the Program in May and accepted a position with the oil and gas industry. The intent is to fill this position on or about October 1, 2000.

Hobart Port Call

The Ocean Drilling Program hosted public affairs events during the recent Hobart port call to enhance awareness of ODP achievements to the Australian science community connected with CSIRO Division of Marine Research, the Australian Antarctic Cooperative Research Centre, the Australian Geological Survey Organization, and the University of Tasmania. These institutions provide financial contributions to ODP/Australia. In collaboration with the ODP/Australia Secretariat and the Antarctic CRC in Hobart, the ODP/TAMU Public Information Office hosted various events and conducted ship tours for the Tasmania science community, government officials and students.

Events:

ODP/TAMU and Transocean Sedco Forex hosted a party for all crew members and technical staff, as well as Leg 188/189 scientists on 12 March at the Grand Chancellor Hotel in Hobart.

Professors Will Howard (Univ. of Tasmania), Garth Paltridge (Director of Antarctic CRC), Clive

Burrett (Head, School of Earth Sciences, Univ. of Tasmaina), Ross Large (Director of Centre for Ore Deposit Research, Univ. of Tasmania), and Nan Bray (Director of SCIRO Division of Marine Research) hosted a VIP tour of their respective institutions for Dr. Bruce Malfait (NSF), Dr. David Prior (TAMU), Dr. Jeff Fox (ODP/TAMU), Dennis Heagney and Donald Ray (Transocean Sedco Forex).

The Australian ODP Council and Secretariat hosted a reception at the CSIRO Marine Laboratories in Hobart on 13 March for the local science community and ODP Leg 188/189 scientists. Dr. Trevor Williams, Deputy Chair of the Australian ODP Council, hosted the event and delivered a speech on behalf of the Australian science community.

Governor Sir Guy Green hosted a reception at Government House in Hobart on 14 March for the Tasmania science community and Leg 189 scientists.

More than 500 scientists, students and government officials toured the ship during the port call. Governor Sir Guy Green was given a private tour on 15 March by Dr. Patrick Quilty, Leg 188 science participant and professor (retired) at University of Tasmania.

News Media:

Australian Broadcast Corporation produced a national radio and television news story discussing Leg 188 results and Leg 189 objectives, as well as the JOIDES Resolution capabilities. Professor Patrick Quilty, Will Howard (Univ. of Tasmania) and Neville Exon (Leg 189 co-chief) were interviewed.

WIN Television produced a national news story, interviewing Pat Quilty regarding Leg 188 science results.

Southern Cross Television produced a statewide news story, interviewing Neville Exon regarding Leg 189 objectives.

Don Woolford, science writer with Australian Associated Press wrote an article regarding the Program achievements and recent expeditions. Neville Exon was interviewed and the article was distributed on the Australian newswire to newspapers and magazines nationwide.

Andrew Darby, science writer for The Age, Sydney Morning Herald, an online Antarctic news service (www.antarctican.com), and Lycos Environment News (ens.lycos.com) wrote an article regarding Leg 188 results and interviewed Phil O'Brien.

Bruce Montgomery, science writer for The Australian wrote an article regarding the recent Program achievements and Leg 188 results and Leg 189 objectives. Neville Exon was interviewed for his article.

Tasmania state and local newspapers, The Mercury, The Examiner, and The Advocate also interviewed Phil O'Brien, Neville Exon and Pat Quilty for news articles published during port call activities.

Spring AGU

Made preparations for the Spring AGU meeting in Washington D.C. ODP/TAMU, with support from ODP/JOI, is responsible for booth management and staffing.

New Brochure

Copy of text was reviewed and changes incorporated. Cover design and layout is in progress. Brochure will be finalized in the summer of 2000.

Public Information Requests

Responded to 23 requests from scientists, news media and the general public regarding ODP promotional materials.

Appendix 1

As the ODP draws to the end, there is an intent to have a definition of the scientific impact of the Program's accomplishments. One element in this endeavor is to quantify the Program's impact by the number of citations that the Program's products have generated. Appendix 1 is an initial report that has been prepared by ODP staff. These data will be reviewed by SCIMP and SCICOM this summer and a final report will be presented to EXCOM at the February meeting. Given the significance of these data in terms of the renewal effort, we thought it timely to share this initial report with EXCOM.

ODP and DSDP Citations Report: Citations from Deep Sea Drilling Project and Ocean Drilling Program Research, 1969–1999

Ann Klaus and Kathy Phillips, May 2000

On 20 December 1999, ODP/TAMU received the American Geological Institute (AGI) database of "Citations from Deep Sea Drilling Project and Ocean Drilling Program Research, 1969–1999." The contents of this database were extracted from GeoRef and slightly modified for use by the ODP (see below for details). Kathy Phillips, Publications Specialist, analyzed the database and prepared the information contained in this report. An in-depth analysis of the data will be prepared by the end of 2000. For more information on specific details not reported in this summary, please contact Ann Klaus, Publication Services Manager (annklaus@ odpemail.tamu.edu), or Kathy Phillips (phillips@odpemail.tamu.edu).

Overview of the Database

AGI indexes and records citations from approximately 3000 foreign and domestic publications, as well as citations from books, other citation databases, and publications arising from meetings. To create the "Citations from Deep Sea Drilling Project and Ocean Drilling Program Research, 1969–1999" database (or DSDP/ODP citation database), AGI used a series of key words to extract a subset of citations related to DSDP and ODP research from the AGI GeoRef database (see Table 1).

Table 1. Key words used by AGI to extract the ODP/DSDP citation database from GeoRef.

All DSDP leg numbers	Initial Reports (serial)
All ODP leg numbers	Scientific Results (serial)
All DSDP site numbers	Technical Note (serial)
All ODP site numbers	Preliminary Report (serial)
ODP	Scientific Prospectus
Ocean Drilling Program	JOIDES Resolution
Ocean Drilling Project	Glomar Challenger
DSDP	JOI
Deep Sea Drilling Project	Joint Oceanographic Institutions
Deep Sea Drilling Program	JOIDES

AGI standardized the citation information in the data set and inserted missing information that had not been previously contained in the standard GeoRef database. For example, they attached first-author affiliation data to approximately 800 Program records. This was important because first-author affiliation data is needed to determine the first author's country of origin, which in turn is needed to analyze the number of publications produced by authors from each country.

One CD-ROM was produced with the specialized database that contains 16,396 citations relating to DSDP and ODP research from 1969 to 1999. The CD was sent to ODP/TAMU Publication Services for exclusive use by staff to generate citation reports for the Program.

The citations database can be divided into "program proceedings" and "nonproceedings" citations (7325 and 9071 citations, respectively). See "Database Parameters" for the definition of "program proceedings." The bulk of this summary focuses on the "nonproceedings" citations in the database.

Database Parameters

- AGI indexes and records citations from approximately 3000 foreign and domestic publications, in addition to books and publications arising from meetings. AGI also obtains citation information from international data-exchange partners in Canada, China, the Czech Republic, Finland, France, Germany, Hungary, Italy, the Netherlands, New Zealand, Poland, Russia, and Spain. There is no guarantee that this covers all publication venues for ODP or DSDP research, but scientific publications throughout the world are represented.

- There is often a time lag between the date new papers are published and the date they are input into the GeoRef database. The length of the time lag varies depending on the source from which AGI gets its information. As a result, the DSDP/ODP citations database does not contain a complete listing of citations from 1999. It is possible that some citations are still pending from 1998 as well.

- The "program proceedings" citations include publications produced and published directly by DSDP or ODP. This includes *ODP Proceedings* and *DSDP Initial Reports* series publications, as well as Scientific Prospectus, Preliminary Report, and Technical Note publications. It does not include other Program publications, such as the *JOIDES Journal.*

- We must assume that some publications that are based on DSDP or ODP data are not identified in this database. If the key words searched in the creation of the DSDP/ODP citations database were not specifically included in the title, abstract, keywords, or body of a paper, that paper would not be included. For example, we know the staff at the JOIDES Office and JOI have identified publications based on DSDP or ODP science that never directly mentioned the Program by name, or Program leg numbers or sample numbers.

- Most of the initial analysis of the database has been based on author affiliation. Author affiliation data include the institution and country of contributing authors. AGI did not begin recording author affiliation information until 1975, so this information is absent from many records. Affiliation is also absent from some records simply because there are many publication venues that do not require an author to supply such information. In addition, some authorships, such as "Shipboard Scientific Party," cannot be given author affiliations because the "author" is a group of individuals from a variety of countries.

  Approximately 1800 citations in this database (~11%) do not have "author affiliation" data. 97% of these records are "nonproceedings" citations. AGI has no plans to update these records in their master database except when ODP/TAMU supplies AGI with the

information to complete those data fields. Although just over 10% of the citations in the ODP/DSDP citation database do not contain country affiliation information, this database represents the best and most accurate record available of the science produced in the scientific literature.

By the end of 2000, ODP/TAMU will evaluate the workload requirements needed to add author affiliation data to the incomplete records and determine if resources are available to carry out the task. It should be noted that adding author affiliation information must be done very carefully because we know there are many authors who have moved from one country to another during the life of the Program. For example, if we are familiar with an author who is listed on a paper with no affiliation information, we may be able to assign a country affiliation if we know the whereabouts of this person. But before we assign a country affiliation, we must know if the journal in question lists addresses at time of submission, at time of acceptance, or at time of publication. And we may need to know the exact date when the author moved from one country to another. Tracking this information will be possible for some but not all records and will take time.

- Since this database contains citations for meeting abstracts and proceedings, a single citation may indicate where a paper/abstract was presented as well as where it was published after the meeting. So, a single record may represent "double" dissemination into the scientific community.

- AGI has agreed to add records from any publication not in the DSDP/ODP citations database for which we supply information, regardless of whether it is a publication they index. For example, before they prepare the updated database at the end of 2000, we can send them the ODP leg-related citation lists we post on the Web, and they will add any new citations they do not have.

Author Information

The author information from the "nonproceedings" citations was analyzed in two ways: (1) by the countries of origin of all authors on each paper and (2) by the country of origin of the first author on each paper.

Countries of origin of all authors

Authors from 78 countries have contributed to 9071 DSDP and ODP "nonproceedings" publications (see Table 2 for the number of times authors from each country have contributed to these papers).

Country of origin of first authors

Scientists from 58 countries have been first authors on over 7200 "nonproceedings" publications. Scientists from countries that have been members of either DSDP or ODP wrote approximately 97% of these publications. Furthermore, 96% of all the publications with first authors from DSDP or ODP member countries are from countries that hold current ODP membership. Most of these "nonproceedings" publications were published by first authors from the United States (4,378 papers, or 60.5% of the citation records that contained author

affiliation data). Table 3 shows the number of publications per country (based on the country affiliation of the first author) for all the countries that are currently members of ODP. See "Publication Categories" for breakdown by publication type.

Table 2. Number of contributions to "nonproceedings" publications by authors from each country.

Country	Number of authors	Country	Number of authors	Country	Number of authors
Argentina	26	Greece	8	Peru	2
Australia	189	Hungary	4	Philippines	4
Austria	16	Iceland	3	Poland	6
Barbados	2	India	72	Portugal	2
Belgium	30	Indonesia	1	Puerto Rico	5
Botswana	1	Ireland	2	Romania	1
Brazil	15	Israel	14	Saudi Arabia	1
Bulgaria	1	Italy	170	Senegal	1
Canada	563	Jamaica	6	Seychelles	1
Chile	5	Japan	490	Slovak Rep.	1
Chinese Taipei	9	Korea	12	Solomon Is.	2
Colombia	5	Lebanon	1	So. Africa	18
Costa Rica	4	Malaysia	1	Spain	39
Cuba	1	Malta	2	Sri Lanka	1
Cyprus	5	Mexico	21	Sweden	97
Czech Republic	3	Morocco	2	Switzerland	130
Denmark	59	Namibia	1	Tanzania	2
Dominican Rep.	1	Netherlands	121	Tonga	2
Ecuador	1	N. Caledonia	3	Trinidad/Tobago	2
Egypt	1	New Zealand	87	Tunisia	4
Estonia	1	Nigeria	4	Turkey	4
Fiji	1	Norway	136	Venezuela	2
Finland	5	Oman	1	UK	835
France	789	Pakistan	1	Un. Arab Em.	1
Fr. Polynesia	2	P. New Guinea	2	USA	4869
Germany	627	PR China	62	USSR	176

Note: These figures only account for citations with author affiliation data (see "Database Parameters").
Numbers include serial publications, meetings, and miscellaneous publications (see "Publication Categories").

Table 3. Number of publications for current ODP member countries.

Country of first author	Number of publications	Country of first author	Number of publications
US	4,378	Netherlands	58
UK	487	People's Republic of China	26
France	468	Denmark	22
Germany	374	Spain	21
Canada	326	Korea	12
Japan	323	Belgium	6
Australia	104	Chinese Taipei	5
Switzerland	75	Finland	3
Norway	73	Ireland	2
Italy	72	Portugal	2
Sweden	64		

Notes: These figures only account for citations with author affiliation data (see "Database Parameters").
Numbers include serial publications, meetings, and miscellaneous publications (see "Publication Categories").

Publication Categories

All "nonproceedings" publications were sorted into three major categories: serial publications, professional meeting publications, and miscellaneous publications. Serial publications include periodic journals, special publications produced as part of a series, and serial publications produced by governments, organizations, and/or institutions. Professional meeting publications include the initial publications of abstracts and/or proceedings for these meetings. This does not include papers, abstracts, and/or proceedings subsequently published in journals or other special publications. Miscellaneous publications include books, maps, etc.

Figure 1 shows the number of citations in each category for the United States vs. all other current ODP member countries or consortiums, based on the first author's country of origin. Figure 2 depicts the breakdown of the number of citations per category for each of the non-U.S. countries or consortiums based on the first author's country of origin.

Figure 1. Citations sorted by category for U.S. and other ODP members, based on first author's country of origin.

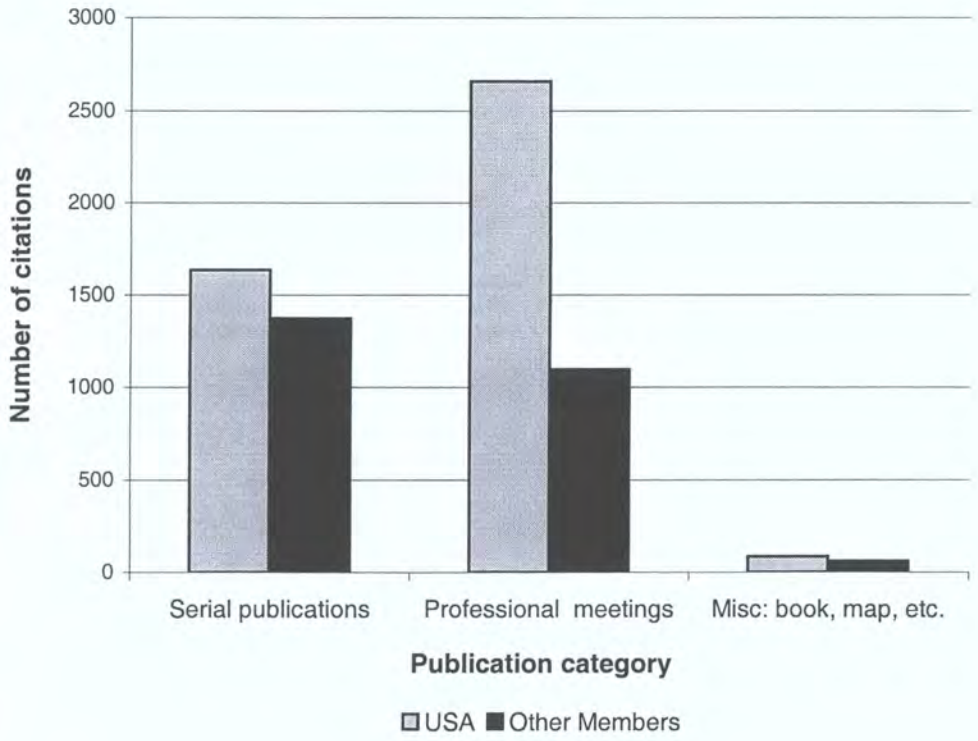
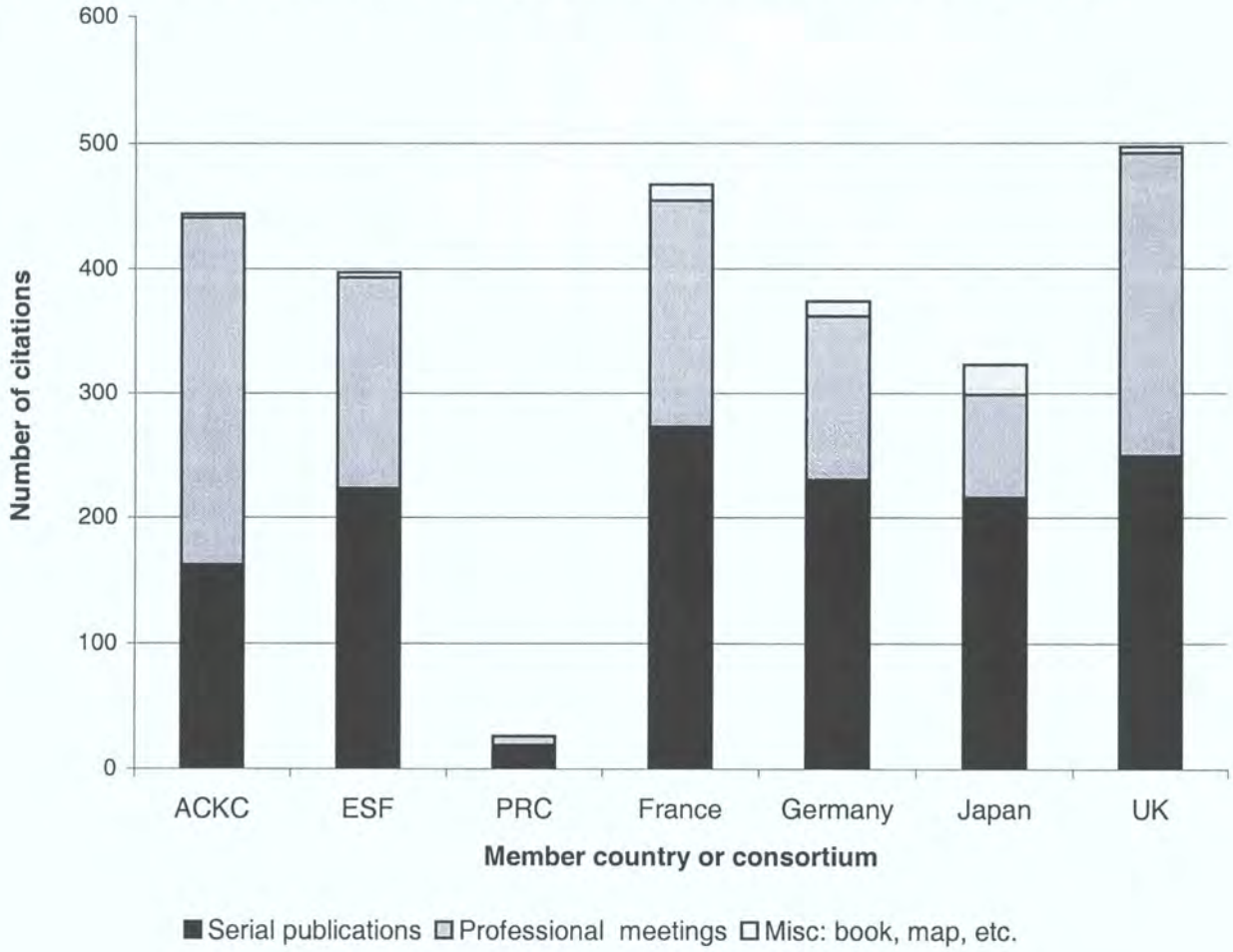


Figure 2. Citations sorted by category for non-U.S. members, based first author's country of origin.



ACKC = Australia/Canada/ Korea/Chinese Taipei Consortium for Ocean Drilling; ESF = European Science Foundation Consortium for Ocean Drilling; PRC = People's Republic of China; UK = United Kingdom.

Citation Distribution in Geoscience Publications

Figure 3 displays the number of "nonproceedings" citations accounted for in the DSDP/ODP citations database vs. the total number of citations from *DSDP Initial Reports* and *ODP Proceedings* volumes.

Table 4 shows the "nonproceedings" citations recorded in the DSDP/ODP citations database with 30 or more citations between 1996 and 1999. Publications with over 100 citations include *Abstr/Prog Geological Soc. Am., Nature,* EPSL, Geotimes, JGR, Marine Geology, EOS, Geology, Mar. Micropaleontology,* and *Geol. Soc. Spec. Publ. (London).* (*Many of these citations represent abstracts of papers that were given at professional meetings.)

Figure 3. Number of "proceedings" and "nonproceedings" citations per year.

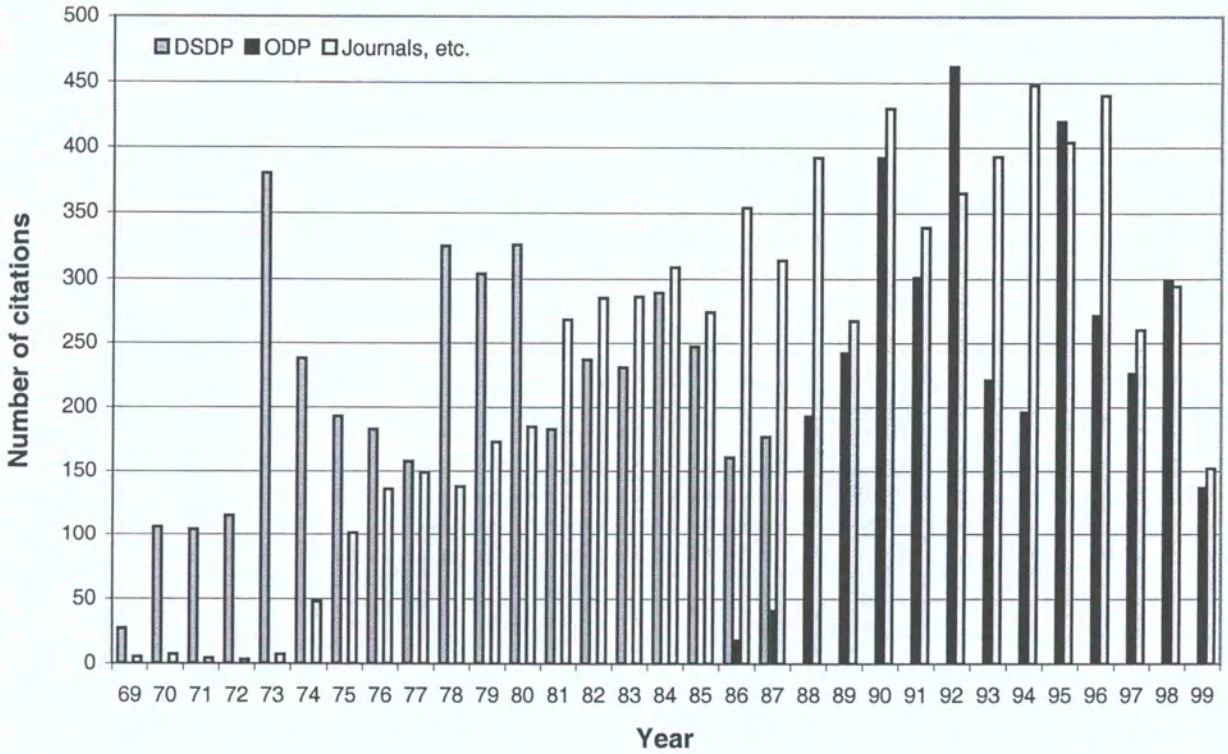


Table 4. Publications with 30 or more DSDP/ODP citations from 1996 to 1999.

Journal title	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	Total
*Abstr/Prog Geological Soc. Am.**		2	7	12	12	32	21	22	22	19	22	32	33	40	49	26	27	14	39	18	34	29	34	24	50	49	37	45	27	29	0	**807**
Nature		1	0	1	6	1	10	5	4	8	6	9	8	15	16	5	14	9	11	5	11	6	2	2	9	6	4	7	8	9	2	**200**
EPSL					2	1	3	5	8	5	9	4	3	2	5	1	0	6	11	5	5	4	10	18	14	12	12	13	12	13	7	**190**
Geotimes	11	12	8	11	9	5	11	7	7	7	5	3	7	10	7	4	4	8	9	9	6	5	2	5	4	4	4	1	0	2	2	**189**
JGR					1	1	3	19	4	1	3	4	11	4	6	1	4	5	5	3	4	24	5	5	10	12	9	10	5	14	10	**183**
Marine Geology			2	0	3	0	1	2	4	9	5	18	3	5	1	6	1	7	4	3	5	1	13	7	6	6	7	8	6	9	20	**162**
EOS	2	0	2	4	40	15	26	19	2	0	0	0	0	0	1	2	1	0	1	1	2	2	5	5	5	6	6	3	3	3	4	**160**
Geology					2	6	3	0	1	1	2	1	1	2	3	4	5	4	1	8	5	4	8	11	9	11	9	20	15	8	13	**157**
Mar. Micropaleontology								2	1	4	5	3	3	2	8	1	2	5	2	1	3	2	3	15	9	9	8	13	9	9	7	**126**
Geol. Soc. Spec. Publ. (London)																6	0	15	4	3	1	7	2	8	7	0	0	8	2	41	2	**106**
Palaeogeogr., Climatology, Ecology									1	1	2	0	3	4	4	6	2	4	1	2	1	1	3	7	2	14	5	2	6	6	5	**82**
Geochimica et Cosmochimica Acta		1	0	0	1	0	2	2	2	0	1	3	3	4	2	0	4	5	3	4	2	2	4	5	4	3	4	3	2	5	3	**74**
Science	1	4	1	1	3	1	3	2	1	3	3	2	4	3	2	4	2	2	2	0	0	2	2	1	3	1	4	7	0	5	3	**72**
GSA Bull					5	1	3	5	3	3	3	4	2	6	5	3	3	2	1	2	1	2	0	3	0	3	3	0	2	2	3	**70**
Micropaleontology							3	2	3	2	3	3	3	5	2	7	0	2	2	1	3	2	2	5	4	2	1	3	2	3	0	**65**
Bull. de las Soc. Geol. de France					1	1	2	5	2	10	5	8	0	6	0	3	5	1	·6	2	1	2	1	0	1	0	1	0	0	1	0	**64**
Geophysical Research Letters										1	0	0	1	0	0	0	2	1	2	1	1	8	1	10	2	3	9	12	1	3	4	**62**
Organic Geochemistry			1	2	0	2	0	0	5	0	0	0	1	0	11	9	0	8	0	4	1	1	0	3	0	3	4	3	2	1	0	**61**
Chemical Geology								1	2	2	0	2	3	5	1	1	1	2	3	7	0	4	1	2	2	3	3	2	1	4	6	**58**
Prelim. Rept.-Ocean Res. Inst., U. Tokyo																				52	0	0	0	0	0	0	0	0	0	0	0	**52**
Comptes Rendus de l'Acad. des Sci.																	3	7	2	2	11	6	4	1	2	0	5	3	1	2	2	**51**
Terra Abstracts																							29	0	18	0	3	0	0	0	0	**50**
Palynology									2	3	0	0	0	1	3	2	1	4	0	14	0	2	4	2	0	0	0	7	0	2	0	**47**
U.S.G.S. Open-file Reports										4	1	0	0	0	0	0	0	1	0	2	0	2	3	8	2	11	1	2	0	0	1	**38**
Canadian Journal of Earth Sciences									22	0	2	0	0	0	0	1	1	0	3	0	1	1	1	1	3	0	1	0	0	0	0	**37**
Geophysical Monograph								4	0	0	0	1	0	0	0	0	3	0	1	0	1	0	0	0	6	0	17	2	2	0	0	**37**
J. Foraminiferal Res.					1	2	1	0	0	3	0	1	1	1	0	1	3	2	1	1	1	0	3	2	1	3	1	2	2	1	1	**35**
Tectonophysics					1	0	0	0	0	1	2	0	0	0	2	4	1	1	2	1	0	0	2	2	1	2	2	3	3	4	0	**34**
AAPG Bull						2	2	5	0	1	0	2	1	2	2	0	3	0	2	0	1	3	2	1	0	1	0	0	0	1	1	**32**
J. Paleontology					1	0	1	2	3	1	2	1	1	4	1	2	1	0	0	2	1	0	1	0	2	1	1	3	0	0	0	**31**
JOIDES Journal												2	0	4	0	0	0	0	0	0	0	0	0	1	4	8	7	0	0	5	0	**31**
Geologische Rundschau										2	0	0	2	0	1	0	0	4	0	0	17	0	1	0	0	1	1	0	0	1	0	**30**
Total per year	14	20	21	31	88	70	95	126	143	148	129	145	144	176	201	153	140	183	159	252	133	284	178	217	298	329	255	294	157	200	98	4881

*Many of these citations represent abstracts of papers that were given at professional meetings (see Figure 1).

Executive Summary

Cruise Highlights:

Leg 188 Prydz Bay

Wireline logging was carried out at all three sites drilled by Leg 188 across the Antarctic continental margin; LWD (Logging-While-Drilling) was carried out at two of those sites with the CDR (resistivity/gamma ray) and Power-Pulse MWD (Measurement-While-Drilling) tools. Downhole logging provided a continuous, in-situ record of remotely sensed rock property data that was particularly useful at Sites 1166 and 1167, where core recovery was poor (<30%).

Downhole weight-on-bit (WOB) and other drilling parameters were recorded using MWD for the first time in ODP. There is significant information on the efficacy of the passive heave compensation system in the comparison between downhole WOB and the WOB measured at the surface, which is used by the drillers in the course of normal drilling operations.

Leg 189 Southern Gateways

Wireline logging was carried out at 4 of the 5 sites drilled by Leg 189. Magnetic susceptibility and natural gamma variability in the logs correlates with variations in the clay and siliciclastic content of the cores. The strong covariance observed in core and downhole measurements allows (through the use of SAGAN) the core material to be placed back into its original stratigraphic position--providing an estimate of the size and location of core gaps and number of cycles missing due to imperfect recovery. In addition, the GHMT provided good total field measurements and the resulting in situ magnetostratigraphy may be useful in refining the shipboard magnetostratigraphy, particularly at Sites 1168 and 1172. Generally, the logs allow for both inter-site correlation and the ability to assess the paleoenvironmental and paleoclimatic significance of fine scale changes in lithologic cyclicity.

Active Heave Compensation

Uphole and downhole drilling data were acquired on Leg 188 using leased Anadrill equipment to evaluate drill string motion under different sea states. Downhole weight on bit, torque and geophysical measurements were made in conjunction with surface weight on bit and torque as measured by both Anadrill and the new FUSION system installed in dry dock. The shipboard active heave compensation system was not available for this experiment so only the passive compensation system was used. Data analysis is underway at LDEO with assistance from TAMU and Schlumberger engineers.

Large Diameter Tool Project

Current limitations in ODP restrict downhole tools to those that can be lowered through a 10-cm drill pipe, yet they must be able to make measurements in holes that are often as large as 40 cm in diameter. This seriously limits tool selection, sometimes impacts log quality, and

excludes the use of many existing industry devices that are larger than 10 cm. Downhole samplers that extract in situ pore fluids like the Modular Formation Dynamics Tester tool (MDT) could be used if a technical means existed to deploy them from the JOIDES Resolution. To this end, we are pursuing a conceptual design of a large diameter tool deployment system that will allow deployment of the MDT via the ODP drill string.

Core/Log Integration Project (CLIP)

Sagan and *Splicer* were updated to allow the opening of Janus output files without modifying them first. The updated versions were installed on Unix computers in the Downhole Measurements and Sedimentology Labs. Final at-sea beta testing of *Sagan* was successfully completed during Leg 189.

Seismic Data Integration

Initial at-sea trials of the IESX seismic data integration software were successfully conducted during Leg 188. Shorebased tests of printing capabilities were also successful.

Logging Manual

Copies of the Logging Manual CD-ROM were distributed to all *JOIDES Resolution* co-chief scientists from the last two years, and comments and opinions were solicited. ODP Logging Services has constructed a web page that users of the Logging Manual can visit in order to provide suggestions and input into the next version of the manual. Because site proponents comprise another important target audience for the manual, copies of the CD-ROMs were also distributed to SSEP panel members

I. MANAGEMENT

ODP Logging Services submitted the draft FY 01 Program Plan to JOI. The plan requests total funds amounting to $5,272,883.

ODP Logging Services personnel assisted with the staffing of the ODP booth at the spring meeting of the American Geophysical Union (AGU).

Elaine Downes was appointed to the post of co-ordinator of LUBR to replace Liane Baldock, who retired in mid-March.

Heike Delius (Aachen) was appointed as a logging scientist at LUBR.

Marsha Meyer was appointed as the new secretary at LDEO-BRG. She replaced Joan Totton who retired in December.

II. STANDARD LOGGING OPERATIONS

Leg 187

No logging

Leg 188 Prydz Bay

Wireline logging was carried out at all three sites drilled by Leg 188 across the Antarctic continental margin; LWD (Logging While Drilling) was carried out at two of those sites with the CDR (resistivity/gamma ray) and Power-Pulse MWD (Measurement While Drilling) tools. Downhole logging provided a continuous, in-situ record of remotely sensed rock property data that was particularly useful at Sites 1166 and 1167, where core recovery was poor (<30%).

At Site 1165, the downhole logs identified a reduction in porosity at the opal A to opal CT transition, the location of carbonate-cemented beds, and the density changes due to varying diatom abundance. A synthetic seismogram was created from downhole porosity to identify the causes of major reflections in the seismic section. The logs are cyclic in some intervals in the Lower–Middle Miocene.

Site 1166 was chosen with the aim of recovering pre-glacial Cenozoic sediments in order to provide an age for the arrival of glaciers in Prydz Bay, and a record of changes in paleo-environments and biota with the onset of glaciation. The downhole logs identified 6 log units with distinctive signatures for the clay, sand and diamict lithologies of the pre-glacial to glacial units that were encountered. Large gamma-ray fluctuations occurred in organic-rich units and highly varied magnetic susceptibility in diamict units. Resistivity and velocity log

data, along with seismic reflection profiles, define a transgressive sequence boundary between early glacial deltaic sands and glaciomarine units.

Site 1167 was logged using LWD tools, after poor hole conditions had restricted the conventional wireline logging of the site to a 60-m interval. Spectral gamma ray and resistivity logs were gathered for the upper 2/3 of the cored sequence and again allowed inference of lithologies identified in the core (e.g. clay layers within the diamict) into the unrecovered sections. Other noted characteristics were the extent of a red bed in the upper part of the section and the transition from granitic clast dominance to sandstone clast dominance within the cored section.

The aims of LWD/MWD at Holes 1166B and 1167B were twofold: to record spectral gamma and resistivity logs with the CDR (Compensated Dual Resistivity) LWD tool; and to record downhole weight-on-bit (WOB) and other drilling parameters using MWD for the first time in ODP. There is significant information on the efficacy of the passive heave compensation system in the comparison between downhole WOB and the WOB measured at the surface, which is used by the drillers in the course of normal drilling operations.

Leg 189 Southern Gateways

Wireline logging was carried out at 4 of the 5 sites drilled by Leg 189. The Triple-Combo toolstring was run routinely while the GHMT-Sonic toolstring was deployed at Sites 1168, 1170 and 1172. Poor weather and operational concerns prevented the FMS-Sonic toolstring from being run at any site other than 1170 where it was used successfully.

Intervals of clear cyclicity are apparent in the gamma ray, magnetic susceptibility, resistivity, density and porosity downhole logs in the sediment sequences spanning the Quaternary to Eocene and will be essential for developing postcruise cyclostratigraphies. Magnetic susceptibility and natural gamma variability in the logs correlates with variations in the clay and siliciclastic content of the cores. The strong covariance observed in core and downhole measurements allows (through the use of *Sagan*) the core material to be placed back into its original stratigraphic position--providing an estimate of the size and location of core gaps and number of cycles missing due to imperfect recovery. In addition, the GHMT provided good total field measurements and the resulting in situ magnetostratigraphy may be useful in refining the shipboard magnetostratigraphy, particularly at Sites 1168 and 1172. Generally, the logs allow for both inter-site correlation and the ability to assess the paleoenvironmental and paleoclimatic significance of fine scale changes in lithologic cyclicity.

III. SPECIALTY TOOLS AND ENGINEERING DEVELOPMENTS

Active Heave Compensation

Results of the first deployment of the DSA core barrel tool during Leg 185 indicate downhole bit motion due to heave. A second deployment of the DSA core barrel tool during Leg 191 while drilling through interbedded charts in moderate sea states was approved by TEDCOM and included in the leg prospectus. Results will be compared with Leg 185 core barrel tests to evaluate the improvements made to the passive heave compensation system in drydock.

Uphole and downhole drilling data were acquired on Leg 188 using leased Anadrill equipment to evaluate drill string motion under different sea states. Downhole weight on bit, torque and geophysical measurements were made in conjunction with surface weight on bit and torque as measured by both Anadrill and the new FUSION system installed in dry dock. The shipboard active heave system was not available for this experiment so only the passive system was used. Data analysis is underway at LDEO with assistance from TAMU and Schlumberger engineers.

Large Diameter Tool Project

Current limitations in ODP restrict downhole tools to those that can be lowered through a 10-cm drill pipe, yet they must be able to make measurements in holes that are often as large as 40 cm in diameter. This seriously limits tool selection, sometimes impacts log quality, and excludes the use of many existing industry devices that are larger than 10 cm. Downhole samplers that extract in situ pore fluids like the Modular Formation Dynamics Tester tool (MDT) could be used if a technical means existed to deploy them from the JOIDES Resolution. To this end, we are pursuing a conceptual design of a large diameter tool deployment system that will allow deployment of the MDT via the ODP drill string.

Core Barrel Temperature Tool

A feasibility study is underway to investigate new core barrel temperature measurements in high borehole fluid temperature environments. The new technology will assist logging and drilling operations where downhole tools are at risk in excessively hot holes.

Third Party Tool Support

LDEO continues to support third party tools through our existing design, manufacture and repair facilities on the LDEO campus. Our shorebased support center has recently been enhanced with the addition of a 1000' test hole and accompanying pressure test vessel.

The NSF funded high-resolution gamma tool (PI: Dave Goldberg) continues on schedule through its third party tool development track. Final plans for deployment of the tool during Leg 191 will be considered by SCIMP in June. Third-party tool support was also provided for Keir Becker temperature tool. The tool was used during Leg 169 and repaired for shipment to the JR in October.

IV. SHIPBOARD LOG ANALYSIS

Core/Log Integration Project (CLIP)

The CLIP software development effort provides the ODP community with a set of graphic, interactive data analysis products for depth-merging and integrating core and downhole log data. *Splicer* is designed for depth-integrating (depth-shifting) multiple-hole core data for building composite sections and developing age models. *Sagan* performs core-log depth-merging using physical parameters which are measured on both cores and by logs. At present, both are fully operating on the JR.

During Leg 189 *Sagan* and *Splicer* were updated to be more flexible in opening different input files and can now open standard Janus format output files. These new versions were installed on the Unix workstations in the DHML and sedimentology labs.

Seismic Data Integration

Initial at-sea trials of the IESX seismic data integration software were successfully conducted during Leg 188. Shorebased tests of printing capabilities were also successful.

V. SHOREBASED LOG ANALYSIS

ODP Conventional Data

The following holes were processed and prepared for inclusion in the database at LDEO-BRG:
Leg 185-Hole 1149B
Leg 188-Hole 1166A
Leg 189-Holes 1168A, 1170D, 1171D, 1172D

FMS Processing

The following holes were processed at the Aix-en Provence (France) processing center:
Leg 188-Hole 1166A

GHMT Processing

The following holes were processed at the Aix-en Provence (France) processing center:
Leg 188-Hole 1166A

Training

Dr. Chris MacLeod visited Leicester for discussions with Drs. Harvey and Brewer regarding analysis of data from Hole 735B.

Dave Feary (Leg 182 Co-Chief) visited LDEO to use GeoFrame and IESX software for analysis of Leg 182 data.

Bernard Celerier from the University of Montpellier visited LMF to work on Leg 180 FMS data.

Caroline Philippot and Florence Einaudi participated in GeoFrame training at Schlumberger-GeoQuest in Montrouge.

Elia d'Acremont from University of Paris VI visited LMF to work on Leg 165 log data.

Saneatsu Saito and Moe Kyaw Thu participated in Schlumberger training at Niigata Prefecture

Harold Tobin from New Mexico Tech visited LDEO for training prior to sailing on Leg 190.

VI. DATABASE

The ODP Log Database has been updated through Leg 186 including Schlumberger original and processed data (conventional, geochemical, and FMS), specialty tools (borehole televiewer, multi-channel sonic, and temperature), borehole images, and sonic waveforms.

Data Migration

All temperature data from Leg 123 to Leg 149 (61 holes) have being reviewed and/or processed for inclusion in the online database.

Historical FMS processing was reviewed and several holes were reprocessed to take advantage of enhancements available with the new GeoFrame processing techniques.

All standard log data from Legs 101-186 are currently online.

Post Cruise Distribution of Log Data

CD-ROMs for Legs 183-189 have been completed and sent to Freisen Printers to be included in the Initial Reports publications.

The Leg 185 CD-ROM is currently in production.

Copies of the Logging Manual CD-ROM were distributed to all *JOIDES Resolution* co-chief scientists from the last two years, and comments and opinions were solicited. ODP Logging Services has constructed a web page that users of the Logging Manual can visit in order to

provide suggestions and input into the next version of the manual. Because site proponents comprise another important target audience for the manual, copies of the CD-ROMs were also distributed to SSEP panel members.

VII. PUBLICATIONS AND REPORTS

Goldberg, D., Collett, T., and Hyndman, R., Ground Truth: In Situ Properties of Hydrate, In: "Natural Gas Hydrate in Oceanic and Polar Environments", M. Max, Ed., Klewer, The Netherlands 2000, in press.

Fothergill, P.A., Brewer, T.S., Handwerger, D., Harvey, P.K., Weedon, G.P., Plio-Pleistocene environmental change in southern New Zealand: Combined log and core analyses from ODP Hole 1119C, *Trans. Amer. Geophys. Union EOS, Dec. 1999.*

Guerin, G. and Goldberg, D., Elastic Wave Dissipation in Gas Hydrates: Amplitude Analysis of Sonic Log Waveforms from the Mallik 2L-38 Well, Mackenzie Delta, Canada, *Trans. Amer. Geophys. Union EOS, Dec. 1999.*

Iturrino, G.J., Goldberg, D., Patterson, D., and Glassman. H., Fracturing in shallow oceanic crust: Observations of downhole velocity anisotropy at Atlantic and Indian Ocean drill sites. *Trans. Amer. Geophys. Union EOS, Dec. 1999.*

Iturrino, G.J., Ildefonse, B., and Boitnott, G. Velocity structure of the lower oceanic crust: Results from ODP Hole 735B, Atlantis II Fracture Zone. *Proc. ODP Sci. Results, 176*: College Station, Texas (Ocean Drilling Program), submitted.

Louvel, V., and Pozzi, J.P., Magnétostratigraphie de séquences océaniques forées dans le cadre du programme ODP. Presentation at SAID/SGF meeting in Paris.

Saito, S., Enami, R., Sun, Y-F., Goldberg, D., Dewatering, compaction, and lithification processes of the NE-Japan forearc sediments: Results from downhole logs during ODP Leg 186, *Trans. Amer. Geophys. Union EOS, Dec. 1999.*

Report on JOIDES - ICDP relations:

In the context of the EXCOM consensus 00-1-9:

EXCOM endorses the following plan for developing closer relations with ICDP.
1. SCICOM will send an observer to the ICDP meeting on 3-4 April 2000 in Merida, Mexico.
2. ICDP will send an observer to the SSEPs meeting on 6-10 May 2000 in Cambridge, U.K., and to the SCICOM/OPCOM meeting on 1-4 August 2000 in Halifax, Nova Scotia, Canada.
3. TEDCOM should arrange to meet with ICDP drilling technology counterparts on 22-23 May 2000 in Potsdam, Germany.

The following actions were taken:

Hay invited ICDP to send a representative to the May, 2000, SSEPs meetings in Cambridge and to the August, 2000, SCICOM meeting in Halifax. Ulrich Harms of the ICDP Office at the Geoforschungszentrum (GFZ) in Potsdam attended the SSEPs meetings and plans to attend the SCICOM meeting.

SCICOM named David Rea to replace Ken Miller as liaison to the ICDP. Ken Miller was to have attended the ICDP meeting in Merida, Mexico in April, 2000, but had to cancel because of illness.

The JOIDES TEDCOM met at the GFZ in Potsdam in May, 2000, and in addition to its regular business heard presentations by Rolf Emmermann, Head of ICDP, and from ICDP drilling technology counterparts Ulrich Harms and Lothar Wohlgemuth of the GFZ Potsdam and Dennis Nielsen of DOSSEC.

Suzanne Hurter of the ICDP Office at the GFZ attended the European ODP Forum in La Grande Motte in April, 2000.

7.2 Relationshps with other organizations: Industry

Data concerning representation of industry in the JOIDES Advisory System and industry-related proposals in the system will be passed out at the meeting.

Following this sheet are

1. Minutes of the Workshop "Cooperation in Scientific Ocean Drilling: Forging Industry-Academic Partnerships" held October 15-16, 1999 in Houston, Texas.

2. A list of the proposals received in response to the Houston Workshop.

3. Notes on the April 16th (2000) GCSSEPM (Gulf Coast Section of SEPM) JOI/ODP + Industry Drilling Meeting (prepared by Richard Fillon).

Goals

Background

Breaking the language barrier

Participants

18 topics

Future proposals?

Workshop

Cooperation in Scientific Ocean Drilling: Forging Industry-Academic Partnerships

October 15-16, 1999, Houston, TX
The Warwick Hotel

Joint Oceanographic Institutions is pleased to announce the workshop "Cooperation in Scientific Ocean Drilling: Forging Industry-Academic Partnerships" held in Houston, TX on October 15-16, sponsored by the U.S. Science Support Program to the Ocean Drilling Program.

Convenors: John Armentrout, Mobil, Workshop Chair
Felix Gradstein, Saga, International Facilitator

Sponsored by: Joint Oceanographic Institutions, U.S. Science Support Program to the Ocean Drilling Program

Goals

Identify basic research issues shared by the academic ocean drilling community and industry scientists, and develop linked strategies to gather data (seismics and borehole), interpret data, assess geological process, and develop models. Meeting outcomes will be used in planning the next phase of scientific ocean drilling. By clarifying shared objectives and identifying possible drill sites, we can identify a common vision addressing both basic science and resource issues. We anticipate future meetings to develop detailed plans for cooperative projects in the current and future ocean drilling programs.

Background

The Ocean Drilling Program (ODP) and its predecessor, the Deep Sea Drilling Project (DSDP), have completed over 30 years of scientific ocean drilling. In 2003, the ODP will end. Planning for a future, multiple-platform international scientific ocean drilling program is now underway.

The scientific and technical achievements of ODP and DSDP are outstanding. Early in the program, during DSDP, boreholes were drilled and samples were collected below some of the deepest parts of our oceans for the first time ever. These early achievements were instrumental in developing our present understanding of plate tectonics. Today the achievements continue. Using
plate tectonics as a framework, ODP scientists test hypotheses to better understand the dynamics of Earth's interior and environment using the ODP drillship the JOIDES Resolution. Over the past 30 years, the picture of the dynamic Earth system has increasingly come into focus because of ocean drilling. This clearer picture has convinced the science community that drilling must continue after 2003. The new Program will include multiple platforms, such as a riser drillship, and riser-less platforms for drilling in shallow and deep water environments. Future

scientific ocean drilling will likely include studies of: the not-yet-explored Arctic Ocean basin; the deep biosphere; climate change prediction; earthquakes in the seismogenic zone; gas hydrates; the global carbon budget; and the seafloor hydrologic system.

Many of these topics are also important to the international oil industry, but are normally framed in a different context: oil exploration, development and production. For example, industry shares with ODP the need to understand stratigraphic signals of major forcing functions (climate,
ocean circulation, paleogeography, and tectonics) that affect the evolution and history of continental margins. Despite these common science interests, industry research uses different language and hinders cooperation. To maximize the success of a future scientific ocean drilling
program, industry and academic scientists agree that they should work together to develop program objectives that are of mutual benefit. This workshop is a first step in this process.

The workshop objectives are to identify: and remove the language barrier between academic and industry researchers; joint industry/academic science objectives; geographic regions of mutual interest for ODP and future program drilling; and industry representatives to participate in planning groups for the future scientific ocean drilling program.

Breaking the Language Barrier: Different Words, Similar Meaning

While not synonyms, the science behind these two sets of words share common research elements:

Geophysical attribute analysis	Direct hydrocarbon indicator
Paleo-productivity	Source rock
Heat flow & kinetic models	Maturation
Fluid flow	Migration
Sedimentary processes	Reservoir, seal, source rock
Physical properties	Seal
Deformation style	Traps & migration avenues
Geochronology	Timing & basin modeling
Microbial biology	Biodegradation
Basin analysis	Exploration
Margin architecture	Petroleum systems

Participants

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Potential ODP-Industry cooperative research topics

The bold topics (5) were the ones democratically chosen as highest priority by the workshop participants.

1. Compaction and controls on it - How is compaction controlled by state of stress, primary & secondary wave velocities, lithology, pore pressure, temperature & time, and other physical properties?

2. **Latitudinal variation in C-cycle - Is there a relationship between the geographic distribution of carbon and paleoproductivity (production) & source rocks (preservation)?**

3. Quality of hydrocarbons - What dictates the quality of hydrocarbons? Factors here relating to tectonics, fluid flow, microbial activity, and thermal properties?

4. Chronostratigraphy/deep-water benthic fauna - What is the time stratigraphic significance of the deep-water faunas? What are their water-mass distributions and migration histories? How can we calibrate the older taxa, particularly for predictive applications relating to Mesozoic paleobathymetry?

5. Pore water chemistry/salinity - What physical/biological factors control the variation seen in pore water chemistry/salinity?

6. **Distribution of gas hydrates - What parameters control their distribution? The availability of hydrocarbon for these deposits is related to?**

7. **Overpressure-mechanisms and generation - What is the relationship of overpressure to compaction, disequilibrium, and other possible generative causes? May they be structurally induced? Contrasts in the overpressure regimes of continental margin vs. abyssal plain settings?**

8. Heat distribution along passive margins - What is the relationship of heat to fluid movement, the relative importance of conduction vs. convection processes, and an explanation of the variation of present-day anomalies in heat flux along passive margins?

9. Evolution of physical properties of hydrocarbon seals - What are the elements of a seal that enable it to confine oil and/or gas? How to these factors relate to physical and chemical diagenesis?

10. Late rifting stages - What are the geological events associated with initial break-up, particularly as they relate to faulting, salt movement, heat injection (thermal history), and general deformation mechanisms?

11. General uplift/subsidence of continental margins - Can a general history of continental margin uplift and subsidence be derived?

12. Exhumation of passive margins - Why do passive margins exhume? What are the post break-up mechanisms for inversion (pop-up) events? Why do they form where they do (in both time and space)?

13. Salt/shale tectonics - How are these materials emplaced? What is the nature of the salt/sediment interface (pressure, fluids, and composition) and the

bio-lithostratigraphic inversion? What are the rock mechanical & rheological properties of these substances?

14. Arctic Ocean and seaways - What is the fundamental stratigraphy, thermal history, chronostratigraphic framework, ridge/rift structure, and spreading nature and timing of the Arctic Ocean and its associated seaways? Connections to Tethys? The nature of the Eurasian/North American plate boundary? The seaways: their sediment sources, paleoproductivity, and paleocirculation?

15. Interaction of plumes and spreading ridges - Is the association of mantle plumes with spreading ridges coincidental? What is the nature of their uplift, heat flow, and effects on margins?

16. Slope stability - When and why do they become unstable?

17. Liquid CO2 sequestering and greenhouse gas monitoring - What can we contribute to the discussions of greenhouse gas management?

18. **Predictive nature of sequence stratigraphy models - What is the predictive value of the Vail/Exxon "eustatic" curve, and can it be adequately tested?**

19. **Turbidite facies and architecture - What factors explain sand distributions, rates of failure and subsidence, migration of deep marine channels & resulting internal connectivity, and channel filling during bypass and abandonment phases? When do levees contain significant amounts of sand? Can we determine global base-level (vs. climatic & tectonic) controls adequately? What is the origin of onlap patterns on basin margins? What is the distribution of, and what are the controls on, HARP deposition?**

Following topics were presented during the workshop as existing or possible future ODP proposals involving both academia and industry

Topic	Champion
New Jersey near-shore	Greg Mountain mountain@ldeo.columbia.edu
Grand Banks slope/basin	Mike Enaschescu enachesj@cadvision.com
Scotian Shelf – deep water (Cret.-Neogene)	David Brown dbrown@cnsopb.ns.ca & David Piper
Maldives – Oligocene-Miocene	Andrei Belopolsky andrei@rice.edu
Rockall/Norwegian Margin (Cret.-Neogene)	Felix Gradstein felix.gradstein@saga.com
N.E. Greenland Shelf	Tony Dore tony.dore@statoil.com
Gulf of Mexico – Pleistocene Fluid, Faults and Turbidites	Peter Flemings flemings@essc.psu.edu & Hans Nelson hans@ocean.tamu.edu

Proposal Tips - Contents of an initial proposal

- Proposal Executive Summary
- Topic
- Scientific objective
- Type of area
- Type of platform
- Special technologies
- Contact Person:
  Name, Address, E-mail, Telephone, Fax
- Content:
  3 pages text – bullets
  Map – cross section
  Model
  3D figure
  etc.

Joint Industry-Academia Proposals originating from the JOI/USSSP Workshop „Cooperation in Scientific Ocean Drilling", October 15-16, 1999, Houston TX, Proposals were submitted to JOI directly

Proposal	Author	Department / Company	Remarks
Northeast Greenland Shelf	Doré, A.G. (1) Lundin, E.R. (1) Spinnangr, Å (1) Beksgaard, L. (2)	(1) Statoil UK, London (UK) (2) Nunaoil	not submitted to JOIDES
JOI/USSAC Deep Drill Experiment Along the northern Gulf of Mexico	Lowrie, A. (1) Lerche, I (2) Moffett, S. (1)	(1) Picayune, MS (USA) (2) Department of Geological Sciences, University of South Carolina, Columbia, SC (USA)	not submitted to JOIDES
Scotian Shelf deep water (Cretaceous-Neogene)	Brown, D.E. (1)	(1) Canada-Nova Scotia Offshore Petroleum Board, Halifax, Nova Scotia (Canada)	not submitted to JOIDES
Grand Banks off Newfoundland: Drilling an Atlantic Margin from Continental Shelf to Rise	Enachescu, M.E. (1)	(1) Husky Oil Operation Ltd., Calgary, Alberta (Canada)	not submitted to JOIDES
Global Sea Level and the Architecture of Passive Margin Sediments: Shallow-Water Drilling of the New Jersey Continental Shelf	Mountain, G.S. (1) Miller, K.G. (1,2) Austin, J.A. (3) Christie-Blick, N. (1) Fulthorpe, C. (3) Sugarman, P. (4)	(1) Lamont-Doherty Geological Observatory, Columbia University, Palisades, NY (USA) (2) Department of Geological Sciences, Rutgers University, New Brunswick, NJ (USA) (3) Institute for Geophysics, University of Texas, Austin, TX (USA) (4) New Jersey Geological Survey, Trenton, NJ (USA)	already submitted to JOIDES in Spring 1999. Last revision Oct. 1, 1999 (564-Full)
Timing and Amplitude of Oligocene/Miocene Sea Level Fluctuations in the Inner Sea of the Maldive Archipelago	Droxler, A.W. (1) Belopolsky, A.V. (1)	(1) Rice University, Houston, TX (USA)	already submitted to JOIDES in 1997. Last revision Oct. 1, 1998 (514-Full3)

Proposal	Author	Department / Company	Remarks
Gulf of Mexico Mini-Basin Depositional Processes, Products, and Stratagraphic Evolution	Nelson, H. (1) Beaubouef, R.T. (2) Damuth, J.E. (3) Kneller, B. (4) Olson, H. (5) Steffens, G. (6) Twichell, D. (7) Weimer, P. (8) Winker, Ch. (9)	(1) Dept. of Oceanography, Texas A&M University, College Station, TX (USA) (2) Exxon Mobil Upstream Research Co., Houston, TX (USA) (3) Department of Geology, Univ. of Texas, Arlington, TX (USA) (4) School of Earth Sciences, University of Leeds (UK) (5) Institute of Geophysics, Univ. of Texas, Austin, TX (USA) (6) Unocal, Houston, TX (USA) (7) U.S. Geological Survey, Woods Hole, MA (USA) (8) Dept. of Geological Sciences, Univ. of Colorado, Boulder, CO (USA) (9) Shell E&P Technology Co., Bellaire Technology Center, Houston, TX (USA)	submitted to JOIDES on 3.22.00 now 587-Pre
The Cretaceous Gateway between the Arctic and Atlantic Oceans	Gradstein, F. (1) Skogseid, J. (2) Doré, A. (3) Eldholm, O. (1) Mutterlose, J. (4)	(1) Department of Geology, University of Oslo (Norway) (2) Norsk Hydro, Sandvika (Norway) (3) Statoil UK, London (UK) (4) Department of Geology, University of Bochum (Germany)	submitted to JOIDES on 3.28.00 now 588-Pre
GeoFluids in the Deepwater Gulf of Mexico	Flemings, P.B. (1)	(1) Department of Geosciences, Penn State University, University Park, PA (USA)	submitted to JOIDES on 3.30.00 now 589-Full

Proposal distributed at the GCSSEPM JOI/ODP + Industry Drilling Meeting 6 April, 2000, New Orleans

JOI/USSAC Deep Drill Experiment Along the northern Gulf of Mexico	Lowrie, A. (1) Lerche, I (2) Moffett, S. (1)	(3) Picayune, MS (USA) (4) Department of Geological Sciences, University of South Carolina, Columbia, SC (USA)	not submitted to JOIDES

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Subject:
Date: Sat, 22 Apr 2000 14:46:16 -0500
X-MSMail-Priority: Normal
X-Mailer: Microsoft Outlook IMO, Build 9.0.2416 (9.0.2910.0)
Importance: Normal
X-MimeOLE: Produced By Microsoft MimeOLE V4.72.3110.3

Hello JOI-ODP-AAPG committee members and deep-ocean scientific drilling advocates:

At the recent AAPG meeting in New Orleans a group of interested industry and academic scientists discussed possible future industry-JOI cooperation in drilling deep, multi-use wells in the Gulf of Mexico and other petroleum basins. Notes from the meeting and suggested future activities in support of deep-ocean drilling are attached in a Word document (a larger, zipped RTF version is available on request). We hope that this work will assist in developing a common ground between industry, academic and government objectives.

Cordially,

Richard H. "Dick" Fillon
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Attachment Converted:
"c:\winnt\profiles\whay\desktop\eudora\attach\GCSSEPM_041600_ODP_JOI_Meeting.doc"

Notes on April 16th GCSSEPM

JOI/ODP + Industry Drilling Meeting

Meeting Objectives:

A. Define shared scientific objectives between ODP and Petroleum Industry for a deepwater Gulf of Mexico core hole which could serve as a proto-type for additional scientific drilling of petroleum system basins world wide.

B. Define process for proposal drafting with specific responsibilities.

List of Attendees:

John Armentrout	Mobil (Retired)	972-242-3272	JArmenRock@aol.com
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Joel Watkins	Tex A&M	979-845-1300	joelw@tamu.edu

IODP Now >> 2003+

Multiple Drilling Platforms

Arctic Barge w/ Icebreakers **Riser Ship** **New Riserless**

Japanese **Other Riser Vessels**

$600 MM – Shakedown 2005
4-6 km hole in Nankei Trough
Seismogenic Penetration – Typhoon season opportunities elsewhere

Other drill locations using other riser drill ships 2003+
Other drill locations for Japanese vessel - 2006+

- Older sediment history
- Crustal penetrations

Meeting Objectives:

What?

- Deepwater old sediment and crust test

Where?

- 3D Seismic necessary for site survey,
- excellent 2D data already available in Gulf of Mexico (GOM),
- eastern Gulf of Mexico (EGOM) 4000m range to crust, "oceanic" and "transform" sites available in EGOM,
- 3-4km water depths, WGOM crustal sites in US waters limited to Baja-like locations (southern Alaminos Canyon area),
- Baja 3D available, WGOM-US sites deep crust and overpressure problems,
- WGOM-Mexico crustal sites possible with Mexican government and Pemex cooperation
- Establish precedent and method for investigating other petroleum basins, West Africa, offshore Brazil, etc.

How?

- First class well plan
  - site proposal & selection
  - pollution safety survey
  - engineering plan
  - drilling technology

When?

- 5yr(?) Project

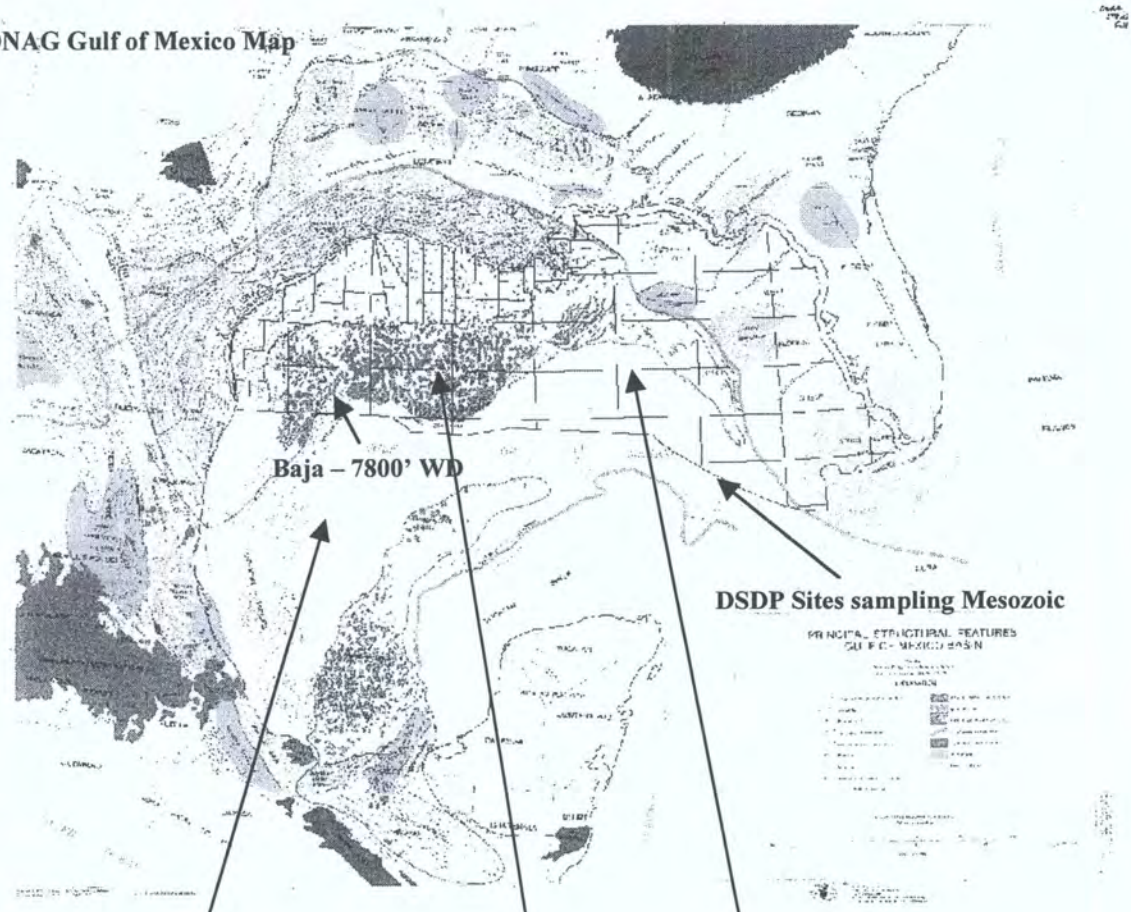
Why?

- Industry + Government + ODP combined objectives and shared support
- Industry - "COST well" and partnering "shared risk" models, hole objectives include possible completion + production
- Government DOE - MMS assessment, precedent Salton Sea hole
- ODP crust > tectonics

How much?

- much more than previous holes due to time on site and depth of penetration plus the riser system

DNAG Gulf of Mexico Map



Western Gulf:
Needs Pemex cooperation-
Overpressure problems in Mexican Ridges?
and Perdido Folds-
Both continental and oceanic crustal targets-

Central Gulf:
Too much sediment and salt-

Eastern Gulf:
Continental, oceanic and transform crustal options-
Riserless shallow drilling and risered deep holes
useful also-

Proposal Draft Process:

- Preliminary Review
- Inside Review
- use ODP website proposal format for preliminary proposal
- Outside Review
- Scientific Committee
- Schedule

Proposal Objective: Defining a Passive (or not so passive) Margin Petroleum System:

1. Younger Sediment
2. Older Sediment
3. Crust

Preliminary List of Scientific Objectives:

- Unconformities (MCU, KT, etc.)
- Age of MCU
- Nature of Crust /Tectonics (continental, transitional, oceanic)
- Crustal Subsidence
- Fracture Zones (controls on fluid flow and on depositional facies) (stress fields, pressure domains)
- Fluid Flow /Diagenesis (petroleum, clay minerals, de-watering)
- Thermal History /Heat Flow
- Paleoenvironments of Oldest Sediments
- Source /Seal facies
- Reservoir Facies
- Mass Transport Complexes (basement influence)
- Loop Current History
- Paleoclimate
- Deep Biosphere
- Down-hole monitoring
- CORKS = "Cap on Hole"

Economic Issues:

- How much will it cost $$? - $15 to $50 MM per site
- Why would industry seek involvement?
- Leverage industry exploration economics
- AAPG involvement – leverage DOE $

Scientific Proposal Committee:

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Industry Professional Organizations Interested in Petroleum System Deep Drilling:

- AAPG

- GCSSEPM

Steps:

1. Merge and Edit Draft Science Proposal (Fillon draft + Lowrie draft)
   Scientific Objectives:
   - What?
   - Where?
   - Why?
2. Develop Government-Industry-ODP $ Support

7 June 2000

Report from the IODP Planning Sub-Committee (IPSC)

OD21 Update

The detailed plans for the OD21 ship are now being drawn up. Budgets for construction of the riser-equipped vessel has been approved since last fiscal year in Japan. So far everything is on schedule. A request has been made to IPSC to work with JAMSTEC to keep abreast of deep-water drilling technology, with the purpose of planning how best to extend the water-depth riser capability of the ship beyond 2500 m, as soon as that is feasible. This task will be carried out in conjunction with members of our Technical Advice Working Group (TAWG) to aid JAMSTEC develop a deeper water well control system.

Non-riser Ship Update

In March 2000, the Conceptual Design Committee, a sub-committee of the U.S. Scientific Advisory Committee, submitted its report on the conceptual design of a "riserless" scientific ocean drilling ship. This report outlines the features of the IODP drilling ship that will take the place of the presently configured *JOIDES Resolution* and form the second dedicated component of IODP drilling capability. This report was forwarded to IPSC by the IWG, with a request that IPSC obtain comments and evaluations of this report from the international scientific community. To that end, IPSC has placed this report on the web along with a questionnaire that requests evaluation of critical aspects of the non-riser ship's capabilities. IPSC has asked the Chair of SCICOM, the Chairs of the Science Steering and Evaluation Panels, and the International Offices of ODP to solicit individual responses from members of their panels and scientific constituencies. IPSC will evaluate and forward the results of this survey to IWG by the end of January 2001.

The Initial Science Plan

Version 2.1 of the Initial Science Plan (ISP) was received from our Science Planning Working Group (SPWG) in mid-February 2000. A revised version (2.2) was completed in late March 2000. This version contains all the planned elements of the ISP and includes some editorial changes made to the Science Themes section of version 2.1. It has been edited and added to by members of IPSC and by other members of the scientific community at IPSC's request.

Version 2.2 of the ISP was sent out to 31 mail reviewers in late March 2000. Reviews were requested from a broad range of scientists having expertise in all the major thematic areas addressed in the ISP. Suggested names for reviewers came from SCICOM, EXCOM, and IPSC. About one third of the reviewers are from Japan, one third from the U.S., and one-third from other nations. To date, we have received reviews (or promises of reviews) from 19 of those requested to carry out a review. These reviews include those from three senior scientists who are not active participants in ODP at this time, one of whom is the exploration manager of an oil company. The ISP (version 2.2) was put on our web page in early April 2000. Comments on this plan have been requested from the scientific community.

In April, a subcontract was signed with Geoprose (Dr. Ellen Kappel) to carry out the tasks of editing and producing the final version of the ISP. Dr. Kappel is already at work on version 2.2 and is in consultation with the chairs of the SPWG and IPSC. IPSC, with designated "volunteers", is now carrying out rewrites of certain sections of the ISP in response to the mail reviews. The SPWG will be conducting a rewrite of the penultimate version of the ISP in late June. Dr. Kappel and her co-workers will produce a fully illustrated and edited version of the ISP by mid-September, when IPSC holds its next meeting. IPSC will

deliver a nearly final version of the ISP to the IWG by 1 October 2000. IPSC understands that IWG will then convene an international review committee of eminent scientists to review the IPSC draft plan for IODP. Results of this review are to be received by IWG in early 2001 for IWG approval. IPSC, the SPWG, and Geoprose will then respond to these reviews and make final corrections and emendations to the ISP. A final, published version of the ISP will be available in May 2001. IPSC expects that individual countries and consortia may write companion documents to the ISP, spelling out those aspects of the IODP Science Plan that they feel are particularly important to their scientific communities.

Science Advice and Management Structures

IPSC continues to evaluate recommendations concerning the IODP Science Advisory Structure. We believe that the general outline of the present ODP Science Advisory Structure has proved its worth and served the community well. However, the IODP will be a much larger program, with multiple operating platforms. Because of this, certain aspects of the structure will need to be augmented and new elements may need to be added. IPSC will be discussing the mandates of the IODP committees and panels over the coming months. To date, we have proposed the following principles that should guide us in constructing the new scientific advisory structure, and a plan for transitioning into this new structure.

Science Advice Guiding Principles:

- IODP should always look like, and function as, a single international scientific program.
- IODP should receive scientific advice from an advisory structure that reviews all proposals, no matter what drilling platform is appropriate to accomplish the proposed science.
- The membership of OPCOM (Operations Committee) of IODP should be expanded commensurate with the anticipated increased complexity of its duties.
- Detailed Planning Groups should be formed to develop the detailed science plan (i.e., drilling, sampling, and measurement strategies) for each riser site far in advance of the site being drilled.
- Membership of key advisory committees should reflect the level of participation of individual IODP partners.

Management Guiding Principles:

- IODP funds, especially science services funds, received by the management structure should be managed collectively at as high a level as possible commensurate with international agreements.
- IODP management structure should be as simple and as streamlined as possible, consistent with functional effectiveness of multiple platform operations and within the context of international agreements.
- An effort should be made to assure good communications at the operational level.
- IODP operations would strive for uniformity and standardization of tools, equipment, and procedures, data format, information system etc. used on all platforms and in all laboratories as much as possible.
- Elements of the structure to oversee operations or products of the operations that are associated with multiple platforms should be placed at a level independent of the science operations management of individual platforms (see New Elements of the Structure, below).

New Elements in the IODP Structure:

Without as yet specifying the total scope of their activities, IPSC has tentatively identified elements of the management structure that might best be developed independently in IODP. These include:

Publication of Science Reports
Database Management
Engineering Development
Downhole Logging and Tools
Education and Public Relations

Transition to IODP.

Transitioning into the new Scientific Advisory Structure should begin after the August 2001 meeting of SCICOM, when the final legs of ODP are scheduled. Elements of the ODP/JOIDES structure must continue to operate after this time; however, the new structure must also begin to develop. To some degree, the phase-down of JOIDES Committees and phase-up of an iSAS (interim Science Advisory Structure) will overlap. In its recommendations, IPSC will be mindful of the unique intellectual resources represented within the present JOIDES structure and the importance of a near seamless transformation of JOIDES into the future advisory structure. IPSC is likely to recommend that initial changes move toward a system that reflects the status of a member's commitment to the IODP.

During the recent IPSC meeting, we have tentatively identified the start-up times of committees and panels in iSAS:

iSAS	Year of Start
IODP Approval Committee	2001
i.SCICOM	2001
i.OPCOM	2002-2003
i.SSEPs	2001
i.DPG (riser)	2002
i.SSP	2001
i.PPSP	2002
i.SciMP	2002

Membership in the iSAS Committees will be a matter of discussion within the IWG. At the next meeting of the IWG, IPSC will be making recommendations to IWG for membership in these committees during the transition of ODP to IODP. Mandates for these committees will be discussed at future IPSC meetings and reported to EXCOM and IWG.

Industrial Liaison with IODP

IPSC believes that a close association with the exploration, geotechnical, and drilling industries will be a new and important element of IODP. During DSDP and ODP, interactions with industry have varied greatly, but usually took place on an *ad hoc* basis. IPSC is making a concerted effort to build a more lasting relationship with relevant industries. Some of the goals of developing such associations are:

- To expand IODP's constituency groups to include industry researchers who could be beneficial to scientific ocean drilling.

- To encourage input from industry scientists in developing scientific ocean drilling goals.
- To obtain advice from industry on data product development that would be useful to scientific ocean drilling.
- To obtain endorsements of the IODP from industry leaders.
- To develop strong links with industry for sharing state-of-the-art technology and data (e.g., seismic profiles).

JOIDES EXECUTIVE AND SCIENCE COMMITTEES JOINT MEETING

THE WASHINGTON MONARCH HOTEL
WASHINGTON, D.C.

15 FEBRUARY 2000

Executive Committee - EXCOM

Helmut Beiersdorf (Chair)	Bundesanstalt für Geowissenschaften und Rohstoffe, Germany
James Briden	Environmental Change Unit, Oxford University, United Kingdom
Maria C. Comas	Instituto Andaluz de Ciencias de la Tierra, Universidad de Granada, Spain, (ECOD)
G. Brent Dalrymple	College of Oceanic & Atmospheric Sciences, Oregon State University, USA
Robert Detrick	Woods Hole Oceanographic Institution, USA
Chris Harrison	Rosenstiel School of Marine & Atmospheric Science, University of Miami, USA
Richard Hiscott	Earth Sciences Department, Memorial University of Newfoundland, Canada (PacRim)
Dennis Kent	Department of Geological Sciences, Rutgers University, USA
Roger Larson	Graduate School of Oceanography, University of Rhode Island, USA
John Mutter	Lamont-Doherty Earth Observatory, Columbia University, USA
John Orcutt	Scripps Institution of Oceanography, University of California, San Diego, USA
David Prior	College of Geosciences, Texas A&M University, USA
C. Barry Raleigh	School of Ocean and Earth Science and Technology, University of Hawaii, USA
Paul Stoffa	Institute for Geophysics, University of Texas at Austin, USA
Asahiko Taira	Ocean Research Institute, University of Tokyo, Japan

Associate Member Observers - EXCOM

Mathilde Cannat	Laboratoire de Pétrologie, Université Pierre et Marie Curie, Paris, France
Wang Zhixiong	Marine High Technology Bureau, Beijing, China

Science Committee - SCICOM

Sherman Bloomer	Department of Geosciences, Oregon State University, USA
Millard Coffin	Institute for Geophysics, University of Texas at Austin, USA
Steven D'Hondt	Graduate School of Oceanography, University of Rhode Island, USA
Patricia Fryer	Department of Geology and Geophysics, University of Hawaii, USA
William Hay (Chair)	GEOMAR Research Center, University of Kiel, Germany
Nils Holm	Department of Geology and Geochemistry, Stockholm University, Sweden (ECOD)
Jock Keene	School of Geosciences, University of Sydney, Australia (PacRim)
Emily Klein	Department of Geology, Duke University, USA
Kenneth Miller	Department of Geological Sciences, Rutgers University, USA
Gregory Mountain	Lamont-Doherty Earth Observatory, Columbia University, USA
David Rea	Department of Geological Sciences, University of Michigan, USA
Alastair Robertson	Department of Geology and Geophysics, University of Edinburgh, United Kingdom
Hidekazu Tokuyama*	Ocean Research Institute, University of Tokyo, Japan
Douglas Wiens	Department of Earth and Planetary Science, Washington University, USA
James Zachos**	Department of Earth Sciences, University of California, Santa Cruz, USA

Associate Member Observers - SCICOM

John Ludden	Centre de Recherches Pétrographiques et Géochimiques, CNRS-Nancy, France
Zhou Zuyi***	Department of Marine Geology & Geophysics, Tongji University, Shanghai, China

* Alternate for Yoshiyuki Tatsumi
** Alternate for J. Casey Moore
*** Absent

Liaisons

Jack Baldauf	Ocean Drilling Program (ODP), Texas A&M University, USA
Jeff Fox	Ocean Drilling Program (ODP), Texas A&M University, USA
David Goldberg	Lamont-Doherty Earth Observatory (LDEO), Columbia University, USA
Neil Lundberg	Department of Geology, Florida State University, USA
Bruce Malfait	National Science Foundation (NSF), USA
Kathryn Moran	Joint Oceanographic Institutions, Inc. (JOI), USA
Julie Morris	Department of Earth and Planetary Science, Washington University, USA

Guests

James Allan	National Science Foundation (NSF), USA
James Austin	Institute for Geophysics, University of Texas at Austin, USA
Mahlon Ball	U.S. Geological Survey, Denver, USA
Keir Becker	Rosenstiel School of Marine & Atmospheric Science, University of Miami, USA
J. Paul Dauphin	National Science Foundation (NSF), USA
Margaret Delaney	Department of Ocean Sciences, University of California, Santa Cruz, USA
John Diebold	Lamont-Doherty Earth Observatory, Columbia University, USA
Sören Dürr	Deutsche Forschungsgemeinschaft (DFG), Germany
John Farrell	Joint Oceanographic Institutions, Inc. (JOI), USA
Chris Franklin	Natural Environmental Research Council (NERC), United Kingdom
James Gill	Department of Earth Sciences, University of California, Santa Cruz, USA
J. Frederick Grassle	Department of Geological Sciences, Rutgers University, USA
Roy Hyndman	Geological Survey of Canada, Sidney, B.C., Canada
Tom Janecek	Antarctic Research Facility, Florida State University, USA
Hajimu Kinoshita	Japan Marine Science and Technology Center (JAMSTEC), Japan
Kazuhiro Kitazawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Shin'ichi Kuramoto	Science and Technology Agency (STA), Japan
Ted Moore	Department of Geological Sciences, University of Michigan, USA
Arthur Nowell	School of Oceanography, University of Washington, USA
Robert Owen	Department of Geological Sciences, University of Michigan, USA
Nicklas Pisias	College of Oceanic & Atmospheric Sciences, Oregon State University, USA
Warren Prell	Department of Geological Sciences, Brown University, USA
Michael Purdy	National Science Foundation (NSF), USA
Mary Reagan	Lamont-Doherty Earth Observatory, Columbia University, USA
Masanori Shinano	International Working Group (IWG) Support Office, USA
Thomas Shipley	Institute for Geophysics, University of Texas, USA
Shiri Srivastava	Geological Survey of Canada Atlantic, Bedford Institute of Oceanography, Canada
Neil Sullivan	Department of Physics, University of Florida, USA
Kiyushi Suyehiro	Japan Marine Science and Technology Center (JAMSTEC), Japan
Shinichi Takagawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Takeo Tanaka	Japan Marine Science and Technology Center (JAMSTEC), Japan
Philippe Vidal	Centre National de la Recherche Scientifique (CNRS), Paris, France
James Watkins	Joint Oceanographic Institutions, Inc. (JOI), USA
Robert Winokur	Consortium for Oceanographic Research and Education (CORE), USA

JOIDES Office

Warner Brückmann	GEOMAR Research Center, University of Kiel, Germany
Bettina Rohr	GEOMAR Research Center, University of Kiel, Germany
Jeffrey Schuffert	GEOMAR Research Center, University of Kiel, Germany

JOIDES EXECUTIVE AND SCIENCE COMMITTEES JOINT MEETING

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15 FEBRUARY 2000

DRAFT MINUTES

A. Welcome, Introductions, and Logistics

Helmut Beiersdorf welcomed everyone to the joint portion of the EXCOM and SCICOM meetings and asked the participants to introduce themselves when speaking. Beiersdorf hoped that this special joint meeting would foster communication among all parts of ODP and help to dispel the perception that EXCOM sat too far removed from the science planning process. He emphasized the importance of these goals, given the difficult task of planning the phase-out of the old program and phase-in of the new one. Beiersdorf looked forward optimistically to a successful meeting and thanked the management at JOI for arranging the meeting facilities and social events.

Kate Moran explained the meeting logistics and introduced Bridget Chisholm and Jenny Ramarui as assistants from JOI. She also noted a few minor changes to the schedule and reminded everyone about a special ODP seminar scheduled for the following evening at the Canadian Embassy.

B. Approval of Agenda of Joint Meeting

Beiersdorf announced several minor changes to the agenda for the joint meeting, and all committee members approved the revised agenda by consensus.

C. Selected ODP Achievements

Warren Prell reported on the preliminary results of Leg 184, the first major drilling expedition in the South China Sea (SCS). He stated the main goal of understanding the Southeast Asia monsoon system and then described the strategy of studying different sedimentary regimes with different sedimentation rates. Prell showed the seasonal pattern of rainfall migration across Southeast Asia and explained that sedimentary records from the SCS should preserve the effects of that seasonal migration and its variability through time. He noted that they drilled at five sites, one in the southern SCS and four in the northern SCS, and logged at four of the five sites. He also noted that to reach the target objectives at three sites, they had to drill deeper than planned because of higher than expected sedimentation rates. Prell said that all of the sites should yield high-resolution records of climate variability on orbital and sub-orbital time scales. In particular, the section recovered at Site 1144 extends to only 1 Ma but has a very high sedimentation rate and thus offers an excellent chance for studying rapid, abrupt climate change. Site 1146 yielded a continuous section extending to 20 Ma with no significant disturbances or turbidites, and Site 1148 penetrated Oligocene (32 Ma) deep-water sediment, thus resolving a debate over the nature and depth of the seismic reflectors at that site.

Hay asked whether sedimentation rates increased in the SCS at 8 Ma, as expected by analogy with the Arabian Sea. Prell said that some of the SCS sites showed an increase in sedimentation rates, but only during last 300 kyr. Miller asked if they had determined the onset of the monsoon system, but Prell said that it would take much more analytical work to answer that question. D'Hondt asked whether the recovered sequences remained rich in sulfate or showed evidence of methanogenesis. Prell said that some methane occurred in the lower parts of the sections. Robertson asked if the results from Leg 184 might shed any light on the tectonic history of the SCS. Prell confirmed that their results definitely could contribute to a better understanding of what happened tectonically at the boundary between continental and oceanic crust.

John Ludden reported on the preliminary results of Leg 185 to the Izu-Mariana forearc. He described the leg as a study of subduction zone fluxes in terms of global geochemical balances and explained the goals of characterizing the geochemistry of the subducting sediment, pore fluid, organic matter, and crust. Ludden said that they returned to Site 801, penetrating the oldest known piece of oceanic crust from a fast-spreading ridge, and drilled a new hole nearby at Site1149. He noted that they found evidence in the basaltic glasses for microbial alteration. Other leg highlights included the first shipboard microbiology tests for contamination and culturing of bacteria and the discovery that a rapid switching of the magnetic signal downhole could explain the apparent magnetic quiet zone as measured from the surface.

Raleigh asked if the sedimentary sections looked fractured as well as the basement. Ludden said that no one looked specifically for fracturing, though one scientist measured shear strength downhole. Comas asked about the recovery at Site 801. Ludden said that they had a recovery rate of 40-50%. Robertson asked if they found any signs of local hydrothermal alteration. Ludden said that they drilled through two active alteration zones, with silica-rich deposits, at temperatures of 50-60°C. Larson described the alteration zones as still very permeable but not active. Morris asked whether the style of alteration differed at these sites compared to other sites such as Hole 504B. Ludden replied that they saw a difference even between the two sites drilled on this leg.

Suyehiro reported on the preliminary results of Leg 186 to the Japan Trench. He described the main objective of installing two geophysical observatories as part of the ION project and mentioned that borehole sensors provide a better signal than seafloor sensors. Suyehiro showed a map of seismic activity around Japan since 1926 and explained that these records played a crucial role in selecting the two drilling sites, with Site 1150 located in a region of high seismic activity and Site 1151 located in an aseismic zone. He characterized the regional subduction zone as tectonically erosive and said that sedimentation rates varied from 20–200 cm kyr^{-1}. Suyehiro described the challenges of drilling through old sediments and cementing instruments in the borehole at 1200 mbsf. He said that the leg ultimately succeeded, although JAMSTEC installed the actual sensors later. Suyehiro showed ROV camera photos of the seafloor package in place, noting the power and data recovery connections on top of the reentry cone. He said that the system can run for several years on battery power, and replacement of the batteries could extend the life of the observatories for many years.

Morris asked if they planned to install a cable for real-time data recovery. Suyehiro confirmed that they planned to extend an existing cable about 10 km to the new sites. Wiens asked when they would retrieve the first data, and Suyehiro said in September 2000. Orcutt asked if they grouted the seismometers in the hole, and Suyehiro said yes. Raleigh asked about the type of transducer used in the instruments. Suyehiro stated that they used a standard linear vertical differential transducer (LVDT). Robertson wondered if any other useful science might result from this leg. Suyehiro replied that other topics of study would include volcanic ash layers, subsidence history, and the much greater decrease in salinity than observed at other active margin sites.

Following the leg reports, Hay offered a summary of recent papers in *Science* and *Nature* related to ODP results. He noted that the authors did not always mention ODP in the title or abstract, but they often used ODP data as reference sections to compare with other new data. Hay said that paleoclimate studies had made an especially strong showing, with emphasis on young sedimentary records, particularly of Holocene age.

Beiersdorf stressed the importance of evaluating the scientific literature for ODP content because of the need to document the achievements of ODP more clearly in the phase-out plan and to address a shortcoming identified by the PEC-V. Allan commented that he had searched the literature last summer, mostly in *Science* and *Nature*, and found over 100 articles related to ODP science. He admitted feeling surprised at how much use the cores had received and the generally good level of acknowledgement to ODP. Watkins recommended that the program should view this as a public

affairs opportunity and do a thorough, systematic job of identifying this information over the next two years. He also suggested approaching the authors and asking them what they would have lost without the ODP data. Beiersdorf hoped to make it a broader, more visible effort. Hay said that SCICOM would definitely devote time to this issue and again emphasized the hidden nature or lack of direct attribution to ODP. Mountain asked if that reflected upon authors from outside of the ODP community or upon those who should know better. Hay replied that the slighting of ODP did not seem intentional. Mountain suggested that the authors of these papers might make good candidates for the distinguished lecture series. Allan saw it as a more serious problem of researchers not properly documenting or acknowledging the source of their samples. Hay said that sometimes he could only trace the link to ODP through the reference list or figure captions. D'Hondt asked whether the papers usually included site numbers. Hay answered yes, but they did not always identify the sites as ODP holes and sometimes even used the pre-drilling site designation. Coffin felt that this simple exercise illustrated the success of the program but also the failure to show that ocean drilling comprises a vital part of the scientific community. He added that even after 30 years of success, we still have to justify the need for more ocean drilling, whereas astronomers, for example, do not have to do this. Raleigh suggested that we have to convince our fellow scientists, not the public or the government.

D. NSF/ODP Council Report

Bruce Malfait diagrammed the NSF programmatic structure and updated the report distributed in the Agenda Book, noting recent personnel changes at NSF, such as the hiring of Margaret Leinen in mid January, and mentioning that some developments had occurred with respect to India joining the program. An audit of JOI indicated that everything essentially balanced out, with unallowable charges amounting to less than $5000 and a few allowable but uncharged items identified. Malfait explained that the U.S. Government Performance Results Act now requires every federal agency to identify its goals for each year and report on how it met those goals. ODP fared well in the sense that it experienced a very low rate of facility downtime, less than 1%, throughout the program. Malfait showed the agenda for the upcoming IWG meeting, noting that Ted Moore would deliver a status report on IPSC and Peggy Delaney would report on progress of the CDC. IWG would also discuss international arrangements for the future program as well as the response concerning the IODP Initial Science Plan.

E. Country/Consortium Reports

Beiersdorf accepted the country and consortium reports as read and invited each national representative to offer additions as necessary. Rick Hiscott introduced himself and Jock Keene as the new PacRim representatives for EXCOM and SCICOM, respectively. Menchu Comas announced that Ireland plans to join ECOD and that ESF would soon submit a Letter of Intent to participate in IODP planning. Asahiko Taira distributed the report from Japan and added that Japan and France would cooperate this year to obtain further 3-D seismic data from eastern Nankai. Jim Briden announced that David Falvey would replace him after this meeting, and Chris Franklin would represent the U.K. at the IWG meeting this week. He also noted that the U.K. would hold an ODP meeting in early March. Mathilde Cannat and Wang Zhixiong had nothing to add to their reports. Beiersdorf introduced Sören Dürr as the replacement for Dietrich Maronde from DFG.

Beiersdorf reported on an ESF sponsored workshop on 27 January 2000 in Strasbourg, France. He said that the workshop participants fully endorsed the IODP Initial Science Plan, and he listed specific topics of interest to European scientists, including the deep biosphere, gas hydrates, Arctic drilling, deep margins, and tectonic processes. Beiersdorf also listed the members of an advisory group for establishing a joint European Ocean Drilling Initiative toward participating in IODP and for advising European funding agencies on ODP/IODP matters. Cannat expressed optimism about this effort. Holm added that the European consortium now had everyone on board to issue a Letter of Intent to join the new program. Taira asked if the European goals on infrastructure included

other platforms. Beiersdorf replied that those goals could include platforms, laboratories, or tools, but they could not yet offer specific details before talking further with funding agencies, political entities, and industry.

F. ODP Management and Operations Report

F.1 FY2001 Budget

Moran illustrated how the FY2001 target budget of $46.1M would distribute among TAMU, LDEO, and JOI and said that the exact numbers could change by about $200K. She showed a map of the FY2001 drilling schedule and explained that Legs 193 (Manus Basin), 196 (Nankai II), and 198 (Hydrate Ridge) would require special operating expenses for LWD. In addition, two advanced CORKS on Leg 196 and microbiology in general would entail added costs.

Moran proposed to switch the schedule for Legs 198 (Hydrate Ridge) and 199 (Equatorial Pacific) because this would effectively defer one relatively expensive leg until the next fiscal year. Detrick asked if such a switch would push Hydrate Ridge into an unfavorable weather window. Moran replied that it looked marginal toward the end of the leg, but Leg 146 had succeeded in the same area during that time of year, plus LWD could wait until the end of the leg and tolerate marginal weather conditions.

F.2 Drydock

Moran identified various shipboard facilities upgraded during drydock, including the data management system, auto station-keeping, the seventh level on the lab stack (primarily for microbiology and downhole tools), the main core lab, H_2S safety equipment, and the Schlumberger data acquisition unit.

F.3 Microbiology

Moran noted several recent achievements with regard to microbiology, including a LExEn grant of $250K for shipboard equipment, definition of shipboard sampling protocols and technical needs by the Biology Under Ground Steering Committee (BUGSCOM), and submission of two microbiology proposals. She said that further plans call for extensive modification of the shipboard microbiology lab on the transit leg in May 2000, with routine staffing of microbiologists beginning on Leg 190 (Nankai Trough). Moran also expressed optimism about moving forward on microbiology collaborations in Europe.

Morris asked about the division of labor between BUGSCOM and the Deep Biosphere PPG. Moran replied that BUGSCOM did its work and has ended. She explained that JOI formed BUGSCOM to implement the recommendations of the Deep Biosphere PPG and SciMP. BUGSCOM provided direct guidance on what equipment to buy and what protocols to follow. Beiersdorf added that the ODP managers had agreed to form this small group to fill a short-term need for quick action before the Deep Biosphere PPG could hold its next meeting.

F.4 ODP Industry Partnerships

Moran reported that good progress had occurred on the HYACE project and the JAMSTEC/JOI agreement for developing the advanced diamond core barrel (ADCB), and work might start soon on retractable bit technology. She described a recent joint academic–industry workshop in Houston as very successful and said that JOI had consequently received seven pre-proposals for review. The proponents planned to prepare those pre-proposals for submission before the 15 March 2000 deadline. Moran commended John Armentrout and Felix Gradstein for their efforts in organizing and leading the workshop and said that a second workshop on geopressures would occur in March 2000. Moran gave a talk to the Canadian Society of Petroleum Geologists in Calgary before a group of more than 800 industry scientists who meet for lunch every two weeks, and JOI had prepared a paper for the Offshore Technology Conference in May 2000. Other scheduled events included a special meeting at AAPG on the Gulf of Mexico and a follow-up workshop in Europe

this summer. Moran also recommended establishing a formal industry liaison committee in ODP and IODP.

F.5 Performance Evaluation Committee (PEC-V)

Moran reported that JOI had received the PEC-V report and obtained comments on it from the ODP subcontractors. She planned to present those comments to the JOI BoG this week and seek their approval to submit the overall report to NSF. She then expected to distribute the report to others in JOIDES for comment. Moran said that PEC-V concluded that program management and operations had improved significantly since the previous evaluation. She explained that although the report contains minor detailed recommendations on management, the major concern of PEC-V centers on the prospect of a drilling gap between ODP and IODP.

Beiersdorf said that EXCOM should see the PEC-V report as soon as possible because it might contain suggestions about JOIDES management with respect to planning and policy making. He conceded that EXCOM had to accept the decision not to distribute the full report yet. Moran said that the JOIDES Office had received a copy and could certainly distribute any part of it. Briden questioned the unprecedented route of implementing the report without obtaining advice from the JOIDES advisory structure. He understood the formal reporting requirements, but noted that all previous PEC reports had gone to EXCOM and SCICOM, and he wondered if the JOI BoG felt content that it could do an optimum job without going through that loop. Raleigh did not think they intended to miss that step. Although he had not seen this report, he noted that previous PEC reports typically dealt with subcontractor issues, and JOI had to assemble the comments of the subcontractors to complete the overall report to NSF. Raleigh promised that EXCOM would receive the report before the JOI BoG acts upon it. Pisias reiterated that the JOIDES Office received the report, so the advisory structure should have it. Hay confirmed that the JOIDES Office had received the report and responded to specific questions posed to it by JOI, but had not seen anything further.

Briden said that as he understood it, the report would go to the JOI BoG, they would report to NSF and that would represent the final step. Moran explained that the full report to NSF would include the PEC-V report and the comments from the subcontractors, including the JOIDES Office, but JOI needed approval from the JOI BoG before they could officially send anything on contracts to NSF. Moran believed that the process had proceeded appropriately. Beiersdorf said that EXCOM would have to review the report carefully and make suggestions at the next meeting on how to respond to immediate issues identified by PEC-V concerning the JOIDES advisory structure. Briden asked if that meant that no action would occur until after July. Raleigh replied that action could occur as soon as the BoG had given their approval. Moran said that they could do so at the meeting this week. Raleigh said that the JOI BoG had no problem with the procedure, and he did not know why it appeared that one existed. Beiersdorf read a portion of the executive summary from the PEC-V report that criticized the lack of a document summarizing the overall achievements of the program. He said that EXCOM must prepare to address this serious issue at its next meeting after receiving copies of the full report.

F.6 Public Affairs

Moran commented on the success of recent public affairs activities, including the June 1999 port call in Yokohama, Japan, the ODP booth at the December 1999 AGU meeting in San Francisco, and the series of four ODP Seminars on Capitol Hill that would conclude this week. She also mentioned several upcoming activities such as the ODP booth and special symposium at the February 2000 AAAS meeting, the March 2000 port call in Hobart, Tasmania, and the May 2000 American Society of Microbiologists meeting.

F.7 Communications
Moran reported that a meeting of representatives from the international program offices in September 1999 at JOI had successfully improved communication and understanding on a program-wide basis. She hoped to schedule a similar meeting in early 2002. Over 300 scientists attended the ODP town meeting at the December 1999 AGU meeting, and the managers of the ODP contractors continue to meet on a regular basis.

G. SCICOM Report, Amendment of Terms of Reference
Hay reported on the final membership of the new PPGs for Hydrogeology and the Arctic's Role in Global Change. He noted that the program effectively had industry money coming in to support Martin Hovland as chair of the Arctic group. Watkins expressed concern about integrating the new USCG cutter Healy into the plans for Arctic drilling. Hay believed that some of the U.S. members on the PPG had the knowledge to address that issue.

Hay presented the following request from SCICOM to amend the Terms of Reference regarding the establishment of liaisons to PPGs.

SCICOM Motion 99-2-16: SCICOM requests EXCOM to amend the Terms of Reference for Program Planning Groups as follows:

6.5 **Liaison.** ~~SCICOM establishes liaison with the PPGs by the appointment of non-voting liaisons~~. The SSEPs will appoint liaisons to the PPGs, and ~~The~~ PPG Chairs ~~will~~ may attend one meeting of the SSEPs per year, ~~as~~ if requested by the SSEPs Chairs.

Mountain asked about the reason for not requiring the PPG chairs to attend a SSEPs meeting once per year. Hay said that the proposed change allows the SSEPs chairs the flexibility to decide when and how often the PPG chairs would attend. Mountain wondered why SCICOM constitutes the PPGs and then lets the SSEPs decide how to incorporate their input into the program. Lundberg explained that the question of how the panel structure should handle the PPGs has a long history, especially concerning the conflict of interest issue, and although SCICOM establishes the PPGs, they decided that the PPGs should report to the SSEPs. He said that the SSEPs hope to communicate more closely with the PPGs and had invited the two new PPG chairs to the next SSEPs meeting, but they do not necessarily want to receive the final PPG reports. Hay added that the PPG chairs now consult regularly with the SSEPs. Beiersdorf deferred voting on this issue until the separate EXCOM session.

H. Partnerships with ODP

H.1 International Continental Drilling Program (ICDP)
Hay reported on the progress of cooperative efforts between ODP and ICDP. He announced that a JOIDES observer would attend the next ICDP meeting for proposal discussion and ranking, and an ICDP observer would attend the next SSEPs and SCICOM meetings. In addition, TEDCOM would meet with the ICDP drilling technology group in Potsdam, Germany. Hay also raised the question of how to pay for liaisons to non-JOIDES meetings.

Larson asked about the membership and budget of ICDP. Miller explained that ICDP has three full members, the U.S., Germany, and Japan, and several associate members, including China, Mexico, and Poland. He also clarified that the $2M annual ICDP budget acts only as leverage; the actual drilling projects have a much higher total budget. Mutter suggested identifying and pursuing the result desired several years from now in terms of a joint commitment, but Hay saw the first step as just getting to know each other. Larson recalled that several years ago the continental drilling side had taken a very open and encouraging view toward merging with ODP. He thought it seemed reasonable from a conceptual standpoint, if not a political one. Beiersdorf stressed the importance of increasing the manpower in ODP to run more platforms and said that he viewed ICDP as the best place to start because of the strong overlap in interests.

Fox noted that TAMU had already received support from NSF and DOSECC for a half-time engineer to design and build a portable lake-drilling platform for ICDP projects. Orcutt mentioned EarthScope and the San Andreas Fault Observatory at Depth (SAFOD) project, but Miller commented that EarthScope did not represent an ICDP or DOSECC activity. Orcutt replied that it nonetheless represented continental drilling and it would most likely receive funding. Fryer noted that COMPLEX had identified high-latitude drilling as an important goal and wondered if EXCOM or SCICOM had considered land-based drilling in Antarctica or the Arctic. Beiersdorf thought that the Arctic PPG could consider the issue and redirected the discussion toward strengthening the connection between ODP and ICDP. He hoped to clarify the liaison and funding issues tomorrow. Miller suggested coordinating along the lines of publications and archiving, two areas where ODP performs well but other groups lack capability. Beiersdorf agreed that the ability to archive non-ODP material represented a good topic of future discussion among EXCOM, SCICOM, and IPSC.

H.2 Industry

Beiersdorf reported on a forum held last November at BGR in Hannover to familiarize German industry with ODP activities. Twenty engineers, managers, and scientists from industry attended the forum, and fifteen ODP scientists gave talks on a variety of themes. The industry representatives requested more meetings of this sort and offered to assist in proposal preparation. Beiersdorf foresaw increased industry participation at the annual German ODP meeting and an expanded basis for recruiting industry experts to staff ODP/IODP advisory panels, though the instability within industry would remain a problem. Briden commented that the European industry forum last year resulted in an increased level of engagement focusing on margins and slopes and a greater awareness of ODP among service and technology components of industry. Beiersdorf noted that industry also participated at the recent Strasbourg workshop, and the European Ocean Drilling Initiative had since begun drafting a proposal aimed toward improving links among various industries and entities for achieving full European membership in IODP. Ludden clarified that they hoped to establish a rotating position for a liaison between national secretariats and industry. Beiersdorf added that the workshop participants stand fully behind this approach and hope to succeed in obtaining funding from Brussels for common proposals or for better databases and technologies.

H.3 Other Scientific Initiatives

Beiersdorf noted that EXCOM at its last meeting had named a subcommittee (Taylor, Mutter, Orcutt, Beiersdorf) for promoting cooperation with other scientific initiatives around the world. He said that although the subcommittee had nothing substantial to report yet, they planned to contact other initiatives such as InterRidge, InterMargins, and ION before the next meeting. Beiersdorf suggested that all EXCOM members could look into these types of initiatives and alert the subcommittee. He viewed this as a first attempt to find common ground for encompassing a larger community, and he said that EXCOM would revisit the issue at all subsequent meetings and discuss how to improve their efforts.

H.4 Distance Learning Initiative

Jack Baldauf reported that the Colleges of Geoscience and Education at TAMU had formed a partnership to establish a Distance Learning Initiative within ODP. TAMU had already received a $350K grant for this project from the State of Texas, and they planned to seek additional external support from corporate sponsors. As an immediate goal, TAMU hoped to sail a high school science teacher on Leg 194. The teacher would broadcast lessons by INMARSAT to students in the classroom, initially targeting rural middle schools (grades 6-8) in Texas. This initiative would deliver shipboard and classroom equipment, a web-based curriculum, instructional material, real-time communication between the ship and classroom, and a professional development workshop at TAMU for teachers. Other benefits would include an enhanced link between ODP and the K-12 education community, direct teacher involvement, and delivery of today's science into the

classroom. The Distance Learning Initiative would greatly increase the educational capability of the *JOIDES Resolution*, and it would lay the foundation for a broad-based educational outreach program. TAMU therefore sought endorsement from EXCOM for sailing secondary school teachers and for the time resources required of ODP/TAMU staff to complete the project.

Cannat asked whether the international community would have access to the web-based curriculum, Klein asked about its availability in other languages besides English, and Fryer asked if TAMU hoped that NSF would support the international effort. Baldauf replied that the international community would have full access to the web-based material and that TAMU hoped to obtain international support for the long-range goals of an expanded outreach program, available in multiple languages. Fryer also asked how this project would affect the berthing of scientists, but Baldauf could not say because TAMU had not yet completed the staffing of Leg 194. Fox mentioned that ODL often had extra berths and perhaps ODP could use one for a teacher. Mutter asked to what extent the teachers would participate in the science onboard. Baldauf said that he would prefer to have them involved, perhaps by training them for one of the simpler jobs, but selecting the right individuals would pose the greatest challenge. Fryer asked how far the plan had progressed, and Bauldauf repeated that TAMU had already received funding and proceeded now with planning how to implement the program. Klein mentioned that some textbooks have a feature box about ODP and urged TAMU to contact publishing companies about publicizing the web links.

Bauldauf showed a USSAC Consensus Statement encouraging SCICOM to sail high school teachers on the *JOIDES Resolution*. Delaney added that USSAC approved the statement after hearing a report from TAMU about the distance learning initiative. Prior explained that the TAMU initiative arose from a concern about the quality of science education in the State of Texas. He emphasized that it would build upon previous efforts in the science and education colleges and provide a springboard for a broader outreach program in the future. Beiersdorf applauded TAMU for their initiative toward the important issue of enhancing science understanding across the globe. He suggested that SCICOM should decide whether the distance learning initiative would have a net positive or negative effect on ODP, balancing the primary concerns about berth space and support for TAMU staff to finish the planning effort against the benefit of expanded educational outreach. Beiersdorf requested SCICOM to craft a motion the following morning and send it back to EXCOM in the afternoon because TAMU could not wait until the next meeting for an answer.

I. IODP Planning

I.1 OD21 Report

Asahiko Taira began by showing a silhouette of the *JOIDES Resolution* superimposed on a silhouette of the much larger OD21 riser drilling ship. Shin'ichi Kuramoto continued with an update on the status of the OD21 science, budget, organization, and basic design and construction of the ship. He showed a timeline of various OD21 activities and stated that STA had already received authorization for 74% of the total $500M budget. Shinichi Takagawa reported that JAMSTEC would complete the design of the riser drilling ship by the end of February 2000 and that construction would begin in March 2000. He showed schematic drawings of the ship and its facilities for core processing, other lab space, and research management. Takagawa explained that the ship would accommodate 150 personnel, mostly with single-room berths (128 single, 11 twin), and the typical single room would occupy 10 m^2 of floor space.

Hiscott asked about the proportion of scientists versus crew. Takagawa said that the basic design allotted for 31 scientists, 21 technicians, and the rest crew, with eight reserves. Harrison noted that the *JOIDES Resolution* accommodates about the same number of scientists and technicians and wondered whether some operations of the riser drilling ship might require a larger science party. Takagawa said that JAMSTEC expected a turnover of the science party during a leg because riser legs would last at least six months rather than two. Taira added that re-supply operations would

provide a chance for turnover of scientific personnel. Larson asked if JAMSTEC had chosen a construction contractor, and Takagawa answered no, not yet.

I.2 Conceptual Design Committee (CDC) Progress Report

Peggy Delaney reported on the charge, strategy, and progress of the CDC. NSF and USSAC established the CDC to formulate a conceptual design for a non-riser vessel. The CDC would identify the optimal capabilities needed for scientific drilling, provide a feasibility survey of existing and planned vessels, and prepare a detailed report by 1 March 2000. Delaney listed the CDC membership, noting that it included a private technical consultant and a liaison from IPSC. The CDC met in June and September 1999 and adopted a strategy for synthesizing high-priority science into type sections and defining the technical requirements for drilling those type sections. They also canvassed existing international ship owners, matched the technical requirements with known ship capabilities, and recommended ships with possible capital modification to NSF.

The CDC requested target sections from the U.S. chairs of the COMPLEX working groups and the PPGs. They asked them to consider high-priority science themes and objectives and specific factors such as water depth range, maximum penetration, lithology, thermal gradients, minimum core recovery limits, maximum core disturbance limits, number of holes, sampling, testing, and logging needs, site survey needs, and environmental conditions. The CDC received thirty target sections and reduced these to nine synthetic target sections related to observatories, rifting processes, convergent margins, oceanic plateaus, hydrothermal massive sulfides, oceanic crust, passive-margin stratigraphy, deep-ocean sediments, and carbonate reefs, atolls, and banks. They determined that the ideal non-riser vessel would drill and keep station in a wide range of water depths (<20–10,000 m), operate globally for up to eight weeks without re-supply, and carry a shipboard party of sixty scientists. It would also have the capabilities to reach target depths of >2000 mbsf, deploy a total drill-string length of ~11,000 m, store sufficient mud and casing, sample continuously, and use the latest sampling, coring, and logging tools. After considering SciMP recommendations, OD21 plans, and consulting with IPSC, the CDC identified other basic shipboard requirements such as 1800 m^2 of heated and air-conditioned interior laboratory space, deck space for ten 20' core-storage reefers and five 20' special-purpose modules, and an underway geophysics lab on the stern.

The CDC contacted nineteen international ship owners to gather information about existing and planned drilling ships. They received twelve responses representing 31 of the 41 ships on their list and compiled an extensive summary of vessel characteristics and operating parameters. Some of the ships do not have dynamic positioning or other basic requirements. The CDC also discussed other platforms, such as geotechnical drilling ships, submersibles, and semi-submersible, jack-up rigs. Delaney distributed a draft survey report to the CDC in December 1999 and submitted a complete vessel survey to NSF in January 2000.

Cannat noted that the *JOIDES Resolution* appears on the CDC list and asked if it met the basic requirements. Delaney answered that every vessel on the list would require at least some modification. Hyndman suggested that the riser ship could also operate in non-riser mode, though not efficiently, and wondered if that might loosen the restrictions on the non-riser ship. Delaney said that the CDC considered whether a non-riser vessel could operate with a seafloor blowout prevention system to drill certain objectives, such as Santa Barbara Basin, and concluded that they would not expect the non-riser ship to do well-control drilling in water deeper than 500 m. They also concluded that shallower-water objectives that need well-control drilling might also require a riser platform and could pose the most difficulty. Hyndman asked whether the riser ship could handle certain deep-water objectives in non-riser mode. Delaney replied that they could set a different screening depth for the total length of drill string, but that would not really change the number of vessels on the list. Fox asked whether any of the ships identified by the CDC already had long-term contracts that would preclude their availability at the start of the new program.

Malfait said that NSF did not ask the CDC for that information and did not receive it. Larson asked how many of the ships would not fit through the Panama Canal, and Delaney said that about half of them would not. Beiersdorf asked if any of the ships had an ice-class rating. Delaney said that only one did, and in all likelihood, ice operations would require another vessel.

I.3 European Initiatives Report

Beiersdorf said that he had already covered this issue in other reports and summarized by saying that the European ocean-drilling community had begun working hard to supply a third leg to IODP. Ludden added that further discussion would take place on new ways to capitalize European involvement in IODP.

I.4 COMPLEX Report

Nick Pisias announced that the COMPLEX Report had reached the final stages of editing, and he expected to see it finished by the end of this month and published by the middle of March. Beiersdorf led EXCOM and SCICOM in applauding the completion of the COMPLEX report.

I.5 IPSC Report

Ted Moore reported on the status of the industrial-liaison, technical-advice, and science-plan working groups and said that the main effort of IPSC so far had focused on the latter group. The science-planning group began work in September and quickly drafted the Initial Science Plan, structured around three general scientific themes and subdivided into nine specific initiatives. The draft plan went for review by mid November and detailed reviews came back in a month. The review board recommended to 1) include an implementation strategy, 2) increase the emphasis on drilling the seismogenic zone, 3) strengthen the justification for a multi-platform drilling program, 4) shorten the document, and 5) correct errors in grammar, punctuation, and editing. IPSC had since named an *ad hoc* advisory group to devise an implementation strategy. They also had posted a revised science plan on the web for further review. Moore thought that the browser version worked best and asked about the experience of others in downloading the science plan. Larson said that the figures did not come out well in the downloadable version.

Moore presented a schedule for reviewing, revising, and submitting the Initial Science Plan. Purdy commented that the IWG had not yet approved that schedule. Robertson asked about the timing of finishing the remaining items of the science plan, and Detrick stressed the importance of seeing a complete document at some point and not just the partial one available now. Miller asked about the appropriate level of discussion and comment to engage in at this meeting. Beiersdorf supposed that everyone had not yet had a chance to read the plan carefully, but all should have an opportunity to provide input. Moore stated that he would like to receive written comments from the ODP community in the next few weeks. Mountain asked if IPSC expected to produce another version of the science plan. Moore replied that the next version would involve a serious rewrite. Beiersdorf congratulated IPSC for their progress on the science plan and asked about the deadline for providing input. Moore said that EXCOM would see the final draft in June.

Moore outlined the basic principles of the IODP scientific advisory structure. Although the new structure would look similar to the current one, it would also include a few new parts, such as a technical planning group, an industry advisory committee, an education committee, and detailed planning groups for riser legs. Harrison suggested that the science committee would have a greatly expanded workload because they would have to deal with multiple platforms. Moore, however, expected that the workload of the science committee would not increase much because the number of riser sites or alternate platforms used per year would remain low. Wiens wondered how the evaluation of riser sites would fit within the guise of the current advisory structure. Moore acknowledged that it would require a lot of work, and he expected that the detailed planning groups would handle most of it. Wiens then asked if proposals would come from outside or within the detailed planning groups. Moore said that SCICOM would have to decide that. Pisias noted that

one of the biggest challenges would stem from the much longer lead time needed for planning a riser drilling leg and how the panel structure would maintain that longer-term view. Moore suggested that planning for the first riser site could begin in 2003 or 2004 and perhaps for the second site before drilling starts at the first site. Ball said that SSP planned to discuss at its next meeting how their workload would change with respect to riser drilling. Beiersdorf noted that the new advisory structure would not begin taking shape for another two years, and for now IPSC only sought approval of the guiding principles rather than the details. Meanwhile, the current advisory structure had to develop a plan for phasing itself out, keeping in mind the contingency that a future program may or may not come into existence. Moore said that IODP would certainly have a different proportional representation than ODP, and he raised the question of how to review proposals during the transition to the new program before knowing its membership. Morris remarked that some proponents had already started showing concern about the continuity between programs. Moore suggested reminding proponents that NSF had already indicated a certain commitment to a new program. He thought proponents should also receive advice on the likelihood of seeing their proposal scheduled in the next program.

Moore reported that IPSC had discussed five possible management structures, and he diagrammed the two selected for further consideration. Miller noted that one of the management structures showed two project managers and asked if that would include two levels of archiving, publications, etc. Beiersdorf saw it as premature to address such details. Pisias wondered whether two project managers would suffice. Moore said that IPSC also discussed the needs for expanded shore-based labs, an expanded OPCOM, an engineering development office, database management and acquisition, science synthesis and educational outreach, improved science and technology exchange with industry, detailed planning groups for riser sites, and long-term monitoring. Coffin suggested that IODP would need a mechanism to ensure adequate site surveying and preparation, saying that industry typically devoted 10% of total drilling costs to such efforts. Moore cautioned that the site surveying necessary to justify a proposal differed from that necessary to justify safety. Hyndman also cited the high cost of riser drilling and associated site surveying, and said that the unlikely chance of getting approval for one without an advance commitment to the other meant that overall approval would have to come much earlier. Moore agreed and said that it would help to develop better ties with industry in this regard.

Beiersdorf felt satisfied with the outcome of the joint meeting and adjourned the committees at 5:00 PM.

JOIDES SCIENCE COMMITTEE MEETING

THE WASHINGTON MONARCH HOTEL
WASHINGTON, D.C.

16-17 FEBRUARY 2000

Science Committee - SCICOM

Sherman Bloomer	Department of Geosciences, Oregon State University, USA
Millard Coffin	Institute for Geophysics, University of Texas at Austin, USA
Steven D'Hondt	Graduate School of Oceanography, University of Rhode Island, USA
Patricia Fryer	Department of Geology and Geophysics, University of Hawaii, USA
William Hay (Chair)	GEOMAR Research Center, University of Kiel, Germany
Nils Holm	Department of Geology and Geochemistry, Stockholm University, Sweden (ECOD)
Jock Keene	School of Geosciences, University of Sydney, Australia (PacRim)
Emily Klein	Department of Geology, Duke University, USA
Kenneth Miller	Department of Geological Sciences, Rutgers University, USA
Gregory Mountain[a]	Lamont-Doherty Earth Observatory, Columbia University, USA
David Rea	Department of Geological Sciences, University of Michigan, USA
Alastair Robertson	Department of Geology and Geophysics, University of Edinburgh, United Kingdom
Hidekazu Tokuyama[b]	Ocean Research Institute, University of Tokyo, Japan
Douglas Wiens	Department of Earth and Planetary Science, Washington University, USA
James Zachos[c]	Department of Earth Sciences, University of California, Santa Cruz, USA

Associate Member Observers

John Ludden	Centre de Recherches Pétrographiques et Géochimiques, CNRS-Nancy, France
Zhou Zuyi*	Department of Marine Geology & Geophysics, Tongji University, Shanghai, China

[a] Alternate for Gerard Bond
[b] Alternate for Yoshiyuki Tatsumi
[c] Alternate for J. Casey Moore
* Absent

Liaisons

Jack Baldauf	Ocean Drilling Program, Texas A&M University, USA
David Goldberg	Lamont-Doherty Earth Observatory, Columbia University, USA
Neil Lundberg	Department of Geology, Florida State University, USA
Bruce Malfait	National Science Foundation (NSF), USA
Kathryn Moran	Joint Oceanographic Institutions, Inc. (JOI), USA
Julie Morris	Department of Earth and Planetary Science, Washington University, USA

Guests

James Allan	National Science Foundation (NSF), USA
James Austin	Institute for Geophysics, University of Texas at Austin, USA
Mahlon Ball	U.S. Geological Survey, Denver, USA
Keir Becker	Rosenstiel School of Marine & Atmospheric Science, University of Miami, USA
Margaret Delaney	Department of Ocean Sciences, University of California, Santa Cruz, USA
John Diebold	Lamont-Doherty Earth Observatory, Columbia University, USA
John Farrell	Joint Oceanographic Institutions, Inc. (JOI), USA
Jeff Fox	Ocean Drilling Program, Texas A&M University, USA
Roy Hyndmann	Geological Survey of Canada, Sidney, B.C., Canada
Tom Janecek	Antarctic Research Facility, Florida State University, USA
Hajimu Kinoshita	Japan Marine Science and Technology Center (JAMSTEC), Japan
Kazuhiro Kitazawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Shin'ichi Kuramoto	Science and Technology Agency (STA), Japan
Charles Langmuir	Lamont-Doherty Earth Observatory, Columbia University, USA
Ted Moore	Department of Geological Sciences, University of Michigan, USA
R. John Parkes	Department of Earth Sciences, University of Bristol, United Kingdom

Charles Paull	Monterey Bay Aquarium Research Institute, USA
Nicklas Pisias	College of Oceanic & Atmospheric Sciences, Oregon State University, USA
Warren Prell	Department of Geological Sciences, Brown University, USA
Mary Reagan	Lamont-Doherty Earth Observatory, Columbia University, USA
Masanori Shinano	International Working Group (IWG) Support Office, USA
Thomas Shipley	Institute for Geophysics, University of Texas, USA
Shiri Srivastava	Geological Survey of Canada Atlantic, Bedford Institute of Oceanography, Canada
Kiyushi Suyehiro	Japan Marine Science and Technology Center (JAMSTEC), Japan
Shinichi Takagawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Takeo Tanaka	Japan Marine Science and Technology Center (JAMSTEC), Japan
James Wright	Department of Geological Sciences, Rutgers University, USA

JOIDES Office

Warner Brückmann	GEOMAR Research Center, University of Kiel, Germany
Bettina Rohr	GEOMAR Research Center, University of Kiel, Germany
Jeffrey Schuffert	GEOMAR Research Center, University of Kiel, Germany

JOIDES SCIENCE COMMITTEE MEETING

THE WASHINGTON MONARCH HOTEL
WASHINGTON, D.C.

16-17 FEBRUARY 2000

SUMMARY OF DRAFT MOTIONS

SCICOM Motion 00-1-1: SCICOM endorses sailing a secondary education science teacher aboard the *JOIDES Resolution*, assuming minimal impact on leg scientific staffing. SCICOM also endorses the time resources required of ODP/TAMU staff (a total of 12 weeks or 2 weeks/FTE) to complete the Distance Learning Initiative. SCICOM requests ODP/TAMU to prepare a final report on the pilot project that would include recommendations for internationalizing this educational outreach program.

Klein moved, Miller seconded; 14 in favor, 1 absent (Rea).

SCICOM Motion 00-1-2: SCICOM recognizes the importance of distributing proposal comments to the community at large and will endeavor to report all comments, both positive and negative, in its minutes and in letters to proponents. On the advice of PANCH, SCICOM will not attribute its comments to specific individuals other than the proposal watchdogs.

Miller moved, Keene seconded; 14 in favor, 1 absent (Rea).

SCICOM Motion 00-1-3: At SCICOM scheduling meetings, proposal watchdogs should draft letters to proponents and the committee should review those letters before the end of the meeting. Immediately thereafter, the JOIDES Office will send the letters to proponents, with copies to the SSEP chairs.

Klein moved, Bloomer seconded; 14 in favor, 1 abstain (Rea).

SCICOM Motion 00-1-4: SCICOM requests the JOIDES Office to draft and distribute the minutes from SCICOM scheduling meetings as early as possible, at least two weeks before the following proposal deadline.

Klein moved, Miller seconded; 15 in favor.

SCICOM Motion 00-1-5: SCICOM recommends that EXCOM make every effort to ensure that active ODP proposals carry forward to the IODP, with SSEP groupings and SCICOM rankings clearly reported. SCICOM recommends that these documents form a basis for initial programming in the IODP.

Wiens moved, Klein seconded; 15 in favor.

SCICOM Motion 00-1-6: SCICOM adopts the following three changes to the science plan for FY2001 and beyond, as recommended by OPCOM:

1. Leg 190 (Nankai I) will have reprioritized drilling sites as proposed by the co-chiefs.
2. Leg 192 (Ontong Java Plateau) will receive three additional days to correct a miscalculation of transit time. SCICOM recognizes the scientific priorities of drilling basement to at least 150 m and logging basement at as many sites as possible. The co-chiefs may decide the best way to implement this plan and maximize the scientific benefits.
3. Legs 198 (Gas Hydrates) and 199 (Equatorial Pacific Paleogene) will switch places on the schedule to save money on port calls and to move the Gas Hydrates leg into the next fiscal year.

Fryer moved, Miller seconded; 11 in favor, 3 abstain (Coffin, Rea, Tokuyama), 1 absent (Mountain).

SCICOM Motion 00-1-7: SCICOM approves the minutes of the August 1999 meeting.

Bloomer moved, Robertson seconded; 11 in favor, 1 abstain (Rea), 3 absent (Fryer, Miller, Zachos).

JOIDES SCIENCE COMMITTEE MEETING

THE WASHINGTON MONARCH HOTEL
WASHINGTON, D.C.

16-17 FEBRUARY 2000

DRAFT MINUTES

WEDNESDAY 16 FEBRUARY AM

SCICOM Subcommittee
(Chaired by Mike Coffin)

A. Formulate Comments on IPSC Report

A.1 IODP Initial Science Plan

Mike Coffin explained that EXCOM expected later in the morning to receive comments and recommendations from SCICOM concerning the IPSC report. He suggested discussing first the Initial Science Plan (ISP) and said that, as one of its authors, he would abstain from the discussion. Coffin recalled that the previous Long-range Plan underwent numerous, tortuous reviews. To avoid repeating this procedure, the working group decided to adopt a similar, though slightly modified structure for the ISP, and they included only those scientific initiatives identified in the CONCORD and COMPLEX reports. Coffin noted that previous reviewers of the ISP had identified several areas of weakness, including the sections on the International Ocean Network (ION), mantle tomography, sea-level change, and continental breakup and sedimentary basin formation. Coffin said that although the working group that wrote the ISP included experts in some of these fields, he deemed these criticisms as valid and asked for further comments.

Moore complimented the working group that wrote the ISP. He explained that reviewers criticized the first draft for not clearly emphasizing the seismogenic zone, and the working group responded by highlighting this topic at the forefront and integrating the relevant discussion into the geodynamics section. Mountain did not see the seismogenic zone as an integral part of the ISP, and he asked Moore to define its target audience and explain its underlying structure. Moore replied that the ISP should address the general international scientific community. He said that its outline moves logically from the hottest new science, i.e., the deep biosphere, to climate and then geodynamics, with the seismogenic zone falling naturally at the end of the geodynamics section. Moore added that the need to emphasize the seismogenic zone as the first target of the riser drilling ship presented a challenge in structuring the ISP, and other ideas included moving this topic to the beginning of the geodynamics section or moving the whole geodynamics section.

Wiens approved of emphasizing the seismogenenic zone and suggested that the ISP should include a brief summary that also highlights other exciting new initiatives such as the deep biosphere. Srivastava agreed that the executive summary should highlight other topics of the new program besides the seismogenic zone. Bloomer felt that the seismogenic zone deserved emphasis because it would probably occupy the largest share of resources in the new program. He suggested that the ISP should also highlight one of the new initiatives for the non-riser ship. Keene expressed concern about placing too much emphasis on the seismogenic zone because the program needed to have other platforms and targets of equal importance for the rest of the community. Mountain remarked that drilling the seismogenic zone would mean penetrating through gas hydrates and the deep biosphere. Allan stated that the executive summary should clearly show the importance of the riser and the non-riser ships. Wiens suggested stressing the hazard aspect of the seismogenic zone because the ISP would likely reach an audience that does not possess a thorough knowledge of marine geology. In other words, it should underline that hundreds of millions of people live in

areas threatened by earthquakes. Moore agreed but said that EXCOM had cautioned him against oversimplifying the science.

Bloomer felt that the ISP did not adequately convey the depth of the discussions at COMPLEX on subduction factory processes and the seismogenic zone. Fryer agreed and stated that it seemed inappropriate to integrate the complex array of subduction factory processes with the well-defined experiment for the seismogenic zone. Coffin explained that the first draft of the ISP contained distinct subduction factory and seismogenic zone components, but the subduction factory disappeared in the second draft after a member of the editorial review board rewrote the entire geodynamics section. Coffin invited input for strengthening that section, noting that although it covers two more initiatives than the other thematic sections, it should have a similar length.

Bloomer expressed concern about the lack of emphasis on Arctic drilling, especially considering the attention this topic received at COMPLEX and the ongoing discussion about alternate platforms. Coffin replied that the ISP would not focus on geographic areas; therefore, Arctic drilling appeared in the climate section, though perhaps less prominently than in the COMPLEX report. Ludden noted that although the Arctic qualifies as a geographic area, its control on climate makes it as worthwhile to study as the seismogenic zone, plus it represents the only new feature in the program. Bloomer asked about the possibility of highlighting the Arctic as a special initiative within the climate section. Moore felt that the executive summary could describe the different platforms available for Arctic drilling.

Mountain commented that the new program should also ensure the availability of alternate platforms for working in low latitudes or shallow water. D'Hondt asked about the number and types of alternate platforms needed. Rea answered that IODP should include platforms for ice-covered regions and shallow-water regions, i.e., two alternate platforms. D'Hondt then asked whether the *JOIDES Resolution* could drill in the Arctic Ocean with icebreaker support. Ludden said that insurance problems would probably prohibit that. Moore expressed sensitivity to the issue of shallow-water drilling and hoped to break the circle wherein a platform would not materialize without proposals, and vice versa. He noted that the implementation part of the ISP specified an allocation of efforts and funds for alternate platforms during the first ten years. Ludden stated that the European committees had set an objective to provide a third platform to the new program. Fryer mentioned the PROD system as a possible alternative to a drill ship in shallow areas. Moore saw this as a very complex issue regarding costs and logistics.

Suyehiro stated that Leg 186 underscored the need for ION borehole stations. He believed that the non-riser vessel could provide the best opportunity to expand the system, and he volunteered to contribute information on this topic for the ISP. Wiens suggested highlighting the framework provided by existing borehole seismic networks on land and the value of getting long-term coverage in the ocean. He expressed concern that if ODP does not drill more boreholes for seismic studies in remote parts of the ocean, then seismologists would have to rely on less-effective and less-sensitive seafloor instruments. Allan thought that sea-floor instruments might work well for shorter period observations. Wiens explained that seafloor and borehole instruments give comparable results only for intermediate period signals, whereas for short and extremely long period signals, borehole instruments provide much better results. Allan remarked that fluid flow produces noise in some boreholes and asked about the need for technology development. Suyehiro confirmed the need to minimize fluid flow in the borehole. Wiens recognized the importance of borehole observatories for geochemistry and said that development had already begun on the technology needed for operating such systems. Ludden asked about the accomplishments expected by 2003. Suyehiro noted that the current schedule includes five ION pilot stations, and he hoped that a few more stations would make the schedule by 2003. He added that ION would ideally require about twenty

stations, but this would take patience to achieve. Coffin asked whether the ultimate goals of ION had changed, and Suyehiro answered no.

Fryer stated that many of the scientific objectives of IODP would require monitoring of fluid circulation and geochemical fluxes, yet the ISP barely mentioned hydrologic monitoring. She thought that the relevant sections of the ISP should highlight this critical need and Coffin agreed. Allan said that if long-term observatories represent an important need, then the ISP should say so. Coffin asked whether this included seismometers. Wiens doubted that anyone would submit proposals to ODP for long-term seismic monitoring. He noted that those who work with land-based stations normally go through IRIS. D'Hondt asked whether IRIS plans to cooperate with ODP on sea-floor monitoring stations. Wiens reported that IRIS had strongly supported the ocean seismic network and seafloor monitoring but would probably receive funding for these activities through other sources. D'Hondt wondered whether ODP/IODP would assume responsibility for long-term monitoring given that most post-cruise science receives funding through the national programs. Fryer characterized the transition period as the ideal time to establish mechanisms for developing and deploying monitoring devices in a sensible manner.

Armentrout commented that the future program would differ from the existing one only in that it would integrate the use of multiple platforms. He also stressed that the way we have collected data so far has not allowed us to monitor and understand processes. Rather than rewriting the individual sections of the ISP, Armentrout suggested writing an executive summary that emphasizes the fundamental interrelationship of the primary research topics and the multidisciplinary effort needed to expand the geographic, stratigraphic, and temporal scope of the existing database. Wiens stated that the ISP should emphasize new goals such as riser drilling as much as possible because of the widespread misconception that ODP keeps drilling holes and doing the same thing over and over again. Ludden commented on the importance of integrating with other programs like Margins and IRIS. Coffin said that IODP could cooperate only with other international programs. Mountain asked about ties with the Margins Initiative regarding common issues such as sediment transport, sedimentary budgets, and impacts on the deep biosphere. Wiens said that he serves on the Margins Steering Committee. Coffin reiterated that IODP would have to interact with InterMargins, not Margins. Moore replied that the partnership section of the ISP would address this topic and could certainly emphasize international programs, though he could not see why it should not also refer to national programs.

Coffin summarized the discussion of the ISP saying that several topics needed strengthening, including mantle tomography, sea level, Arctic climate, continental breakup and sedimentary basin formation, and hydrologic monitoring. The seismogenic zone also should receive greater emphasis as a major allocation of resources. Coffin suggested that Wiens and Suyehiro could work on the mantle tomography section, while Miller and Mountain try to improve the sea-level section. He also welcomed input from John Armentrout for the section on continental breakup and sedimentary basin formation. Fryer noted that the ISP did not mention non-accretionary margins and offered to write additional text. Bloomer mentioned the topic of subduction factories. D'Hondt volunteered to help with the deep biosphere and environmental change sections. Coffin encouraged all SCICOM members to review the ISP and send their comments directly to Moore by the end of February. Moore said that he could make small changes himself, but he did not want to change the length of the ISP significantly, and large structural changes would require a consensus of IPSC. Ultimately, he hoped that the ISP would address the scientific interests of the entire ocean drilling community.

A.2 IODP Science Advisory Structure

Coffin shifted the discussion toward the proposed science advisory structure of IODP and noted the absence of a Detailed Planning Group (DPG) for alternative platforms. Moore explained that

SCICOM usually appoints DPGs to work with the proponents of an existing proposal, or a set of proposals such as those submitted by ANTOSTRAT, to finalize the science plan before it reaches SCICOM for ranking. He promised, however, to examine how this mechanism could apply to alternate platforms. Mountain preferred the idea of having a standing advisory group with appropriate expertise because the use of alternate platforms would probably involve a complex array of tools. Klein suggested adding a technical planning group for alternate platforms. Mountain replied that those groups would report only to OPCOM, whereas a PPG would advise on science and work with the proponents. Moore noted that PPGs lack the status of standing committees.

Fryer asked whether OPCOM could provide suggestions on the availability of alternate platforms or appoint DPGs for specific needs. She suggested that a standing committee or technical planning group for alternate platforms could provide appropriate advice to proponents or the SSEPs. Klein also pictured a loop from a small, knowledgeable advisory group back to drilling proponents. Moore disagreed about the need for a dedicated committee and suggested that one of the other technical planning groups, such as the one for industry liaisons, could provide the necessary information and make it available on the web to proponents. Klein suggested having an optional committee. Bloomer suggested SciMP, but all disagreed. Rea and Allan thought that the operator or one of the contractors could do it. Bloomer noted that IODP would have multiple contractors for riser and non-riser drilling. Moore asked what would happen if IODP has two science operators. Mountain suggested having three advisory groups to the SSEPs, i.e., for riser, non-riser, and alternate platforms as needed. In addition, the technical planning groups or the industry group should provide information about the availability of different tools.

Coffin summarized the discussion saying that IPSC needed to consider how alternate platforms would fit into the advisory structure and how proponents could obtain information about the nature and availability of alternate platforms. Wiens asked how the advisory structure would work with large, complex riser proposals that would require an order of magnitude more resources. Suyehiro replied that Roy Hyndman would give an outlook on that scenario the next day in the SEIZE DPG report. Coffin concluded the discussion saying that IPSC should clarify how the new program would handle proposals for riser drilling. Moore added that IPSC had tried to calculate the costs of the first riser site and estimated that site surveys alone would cost at least $9-10 million and perhaps more than twice that much.

A.3 IODP Management Structure

Coffin asked for comments on the IODP management structure. Moore identified the biggest difference in management as the fact that JAMSTEC would play a large role in the new program. He presented two management models, one showing separate project managers for riser and non-riser drilling and the other showing a single project manager overseeing the operations of both primary vessels. Bloomer asked if the first model implied that two different organizations would manage the storage of cores. Moore said no, but added that with two project managers, a real choice would exist for locating other projects such as monitoring devices, data management, and publications. Miller wondered where archiving and publication would fit in the management structure. He believed that these activities required central coordination and that this should constitute a scientific issue and not a management decision. Moore replied that the preferred model allowed for coordinated activities only at the International Program Manager level. Bloomer suggested including the tasks for each entity shown in the models. Moore replied that IPSC had designed the models in the simplest possible way for IWG, not SCICOM, and for now the concerns of IWG focused exclusively on the future program manager and the financial input.

Ludden mentioned the European initiative to contribute to IODP in terms of alternate platforms and asked how this component fit within the management models. Moore believed that the

management models should not include a third major cost center until IPSC sees a firm commitment of sufficient financial support. He added, however, that with enough proposal pressure, this or any other program could include alternate platforms on an "as needed" basis. Coffin asked whether a consensus existed among SCICOM to recommend that the management models should include a separate box for alternate platforms. Srivastava felt that such a model would help the efforts of the European consortium. Bloomer recognized the importance of the European initiative, but said that he would not explicitly include alternate platforms in the management model without a more concrete plan. Coffin suggested recommending to EXCOM that if financial support emerges for alternate platforms, IPSC should consider including a separate box for them in the project management structure. Fryer agreed, but Klein said that it would amount to EXCOM discussing a question mark. Wiens found the discussion premature and suggested forwarding only a comment so that IWG would start thinking about alternate platforms. Moore explained that he had presented only two of the five models considered by IPSC. Coffin stated that although management issues do not primarily concern SCICOM, alternate platforms do, but lacking a consensus, SCICOM could only advise EXCOM that they wanted to receive an update on this matter as it progressed.

B. Appointment of Liaisons to Other Panels

Coffin announced that SCICOM needed to appoint a new liaison to ICDP because Ken Miller would rotate off SCICOM after the August 2000 meeting. As discussed previously, the new liaison should attend the April 2000 ICDP meeting in Mexico. Coffin noted that Rea had volunteered to serve as liaison to ICDP and appointed him in absence to replace Ken Miller. Coffin also appointed D'Hondt as watchdog for the Arctic PPG and Andy Fisher in absence as watchdog for the Hydrogeology PPG. (Ed. note: Fisher's term on SCICOM begins at the first meeting in 2001.)

C. Other Topics

C.1 Distance Learning Initiative

Coffin opened a discussion of the Distance Learning Initiative, as described by Baldauf during the joint meeting, and asked for comments on the two recommendations. Baldauf explained that the project could involve a trade-off between berthing a scientist or an educator. He thus wanted to ensure that TAMU received an endorsement to move forward, specifically concerning Leg 194. Baldauf stressed that the program would take advantage primarily of available funds from the State of Texas, but TAMU also sought endorsement for a small salary component related to ODP employee efforts, totaling twelve weeks of time or two weeks each for six individuals.

Klein favored endorsing the recommendations. Miller saw the initiative as a good use of resources but expressed concern about filling a science berth with a teacher, especially for a leg such as Leg 194 that would require an intensive effort by the shipboard scientific party. He also wanted to define better the shipboard role of the teacher. Fryer suggested as a compromise having the teacher sail as a technician who would assist with core processing, archiving, or photography. Baldauf answered that TAMU definitely wants to involve the teacher in shipboard activities, and they view the technical component as a way to minimize the potential impact on the science. Miller recognized the importance of maintaining maximum flexibility for Leg 194 and TAMU and said that he would approve the recommendation if it included the phrase "assuming minimal impact on leg staffing". Bloomer called for an explicit commitment on the cost-sharing effort because it concerned co-mingled funds. Baldauf agreed that this would require additional consideration for the long-term approach, but for now TAMU wanted only to devote the personnel to install the necessary equipment on board.

D'Hondt favored the initiative but had concerns about asking the foreign partners to fund a secondary education project in the U.S. Klein suggested adding a phrase about the intent of internationalizing it. Baldauf replied that he had seen an opportunity to advance the initiative while

bringing in significant external funds, but he understood the concerns. Coffin invited comments from the international committee members. Ludden approved of the initiative and supported making it an international project in the future. Tokuyama also approved and asked about the possibility of international teachers. Baldauf described the initiative as a pilot project for Leg 194, with some technical hurdles to overcome, but TAMU hopes eventually to establish it as a routine program and expand it to a global system. Klein suggested requesting a written report that would include suggestions on how to internationalize the project. Baldauf replied that TAMU already intended to do deliver such a report. Mountain suggested that TAMU should come back to SCICOM in August with an updated plan.

Tokuyama asked how much time the teachers would spend onboard. Baldauf answered that the teacher would participate for the entire cruise on Leg 194. Mountain preferred this option because otherwise the teacher might end up onboard only for operations such as logging. Wiens noted that two months represents quite a long time and asked whether TAMU could check with other organizations about their experience in this respect. Baldauf said that he would gladly take suggestions for additional contacts. He explained that TAMU planned a significant training program directed toward helping the individuals involved understand the scientific objectives. Prell asked about the time dedicated to training. Baldauf replied that for students it would depend on the individuals and could range up to several days. Coffin asked whether the current proposal funding covered one teacher sailing on one leg. Baldauf replied that TAMU had not yet received the funding. Coffin thanked Baldauf for his efforts and noted that Hay had asked the committee to present a motion with regard to the Distance Learning Initiative to EXCOM. After a brief discussion about the wording of the motion, Coffin asked Klein and Miller to rewrite it accordingly, and a vote followed.

SCICOM Motion 00-1-1: SCICOM endorses sailing a secondary education science teacher aboard the *JOIDES Resolution*, assuming minimal impact on leg scientific staffing. SCICOM also endorses the time resources required of ODP/TAMU staff (a total of 12 weeks or 2 weeks/FTE) to complete the Distance Learning Initiative. SCICOM requests ODP/TAMU to prepare a final report on the pilot project that would include recommendations for internationalizing this educational outreach program.

Klein moved, Miller seconded; 14 in favor, 1 absent (Rea).

C.2 SCICOM minutes and proposal comments

Miller explained that since the JOIDES Office had begun posting the official minutes on the web, SCICOM had not formulated a policy of how to present the discussion of proposals without attributing comments to specific individuals. He believed that up to now the minutes contained rather the positive comments, though he recognized the importance of also conveying the criticisms to the proponents. Miller also said that even in a sanitized version of the minutes, one could often still identify the source of certain comments. Bloomer stated that the community should not necessarily see the full minutes, but we should at least keep them informed about actions, decisions, and a summary of the proposal discussion. Klein replied that SCICOM had to address the separate issues of what to include in the minutes and the content of the letters to proponents. She noted that the proposal watchdogs currently write rather short notes that do not capture the entire discussion.

Bloomer believed that some proponents may have felt frustrated by the lack of information after the previous SCICOM meeting, and he stated that this problem needs fixing. Miller characterized the meeting as extremely busy, but he agreed that SCICOM should distribute the proposal comments as quickly as possible. Lundberg added that letters did go out quickly to the proponents but did not contain enough information, and the proponents then contacted the SSEPs watchdogs, who did not know anything about the SCICOM discussions. Wiens suggested that SCICOM should allot the necessary time for writing their proposal comments during the meeting. Miller admitted that a

number of SCICOM watchdogs had delayed in forwarding their reports to the SSEPs and suggested that the SCICOM chair should ensure that these reports go out immediately after the meeting. Bloomer asked whether it would solve the problem with the minutes if these letters counted as minutes. Lundberg noted that the minutes contained far more information than the letters; therefore, he asked to have the minutes published well before the next proposal deadline so proponents could benefit from the proposal discussion. Mountain doubted that proponents would want to see their rejection letters posted as minutes on the web. Miller replied that the minutes had to remain public. Bloomer thought that the benefits of communicating the SCICOM discussion outweighed the possible side effects.

Coffin felt that by the time a proposal reaches SCICOM, it has already experienced more than one review and should thus represent a good proposal. Lundberg disagreed and said that the SSEPs had to forward to SCICOM all externally reviewed proposals regardless of quality. Miller noted that SCICOM could decide not to include a proposal in the global ranking, but they at least had to discuss it. Coffin still believed that most proposals received harsher reviews externally than in the SCICOM discussions. Klein did not favor a synopsis because the minutes contained many more details. Bloomer asked whether this meant rewriting the minutes as a generic discussion. Morris thought that this brought matters back to the initial suggestion of Miller. Miller wanted the current minutes to mention as an operational request that SCICOM watchdogs should receive the final copies of the letters. A brief discussion ensued about whether the motion should refer just to scheduling meetings or to all meetings. Miller questioned the feasibility of the latter and noted that this motion would set as a first priority to publish the SCICOM minutes in a timely manner.

SCICOM Motion 00-1-2: SCICOM recognizes the importance of distributing proposal comments to the community at large and will endeavor to report all comments, both positive and negative, in its minutes and in letters to proponents. On the advice of PANCH, SCICOM will not attribute its comments to specific individuals other than the proposal watchdogs.

Miller moved, Keene seconded; 14 in favor, 1 absent (Rea).

SCICOM Motion 00-1-3: At SCICOM scheduling meetings, proposal watchdogs should draft letters to proponents and the committee should review those letters before the end of the meeting. Immediately thereafter, the JOIDES Office will send the letters to proponents, with copies to the SSEP chairs.

Klein moved, Bloomer seconded; 14 in favor, 1 abstain (Rea).

SCICOM Motion 00-1-4: SCICOM requests the JOIDES Office to draft and distribute the minutes from SCICOM scheduling meetings as early as possible, at least two weeks before the following proposal deadline.

Klein moved, Miller seconded; 15 in favor.

Morris explained that the issue of communication between SCICOM and the SSEPs arose when the SCICOM liaison to ESSEP could not attend the last meeting. She said that the SSEPs wanted SCICOM to name alternate liaisons, but she did not know whether this required merely an agreement or a motion. Miller explained that SCICOM generally does appoint liaisons and alternates on an established rotation schedule, and he asked whether the agenda included this item. Coffin answered no because the current SSEPs liaisons would not rotate off SCICOM until next year. Lundberg stated that SCICOM had not named alternate liaisons to the SSEPs. Fryer asked whether this constituted an important issue. Morris replied yes because although the single SCICOM liaison tried last time to inform both ESSEP and ISSEP about SCICOM opinions, it would have helped to have a second liaison present. Coffin did not see a need for a motion because an established procedure already existed. Lundberg said that the SSEPs chairs would at least like to know the identity of the alternate liaisons from SCICOM so that they could keep them informed.

Morris mentioned that the panel chairs had discussed during their meeting the importance of the PPGs keeping minutes and subsequently posting them on the web. Coffin suggested postponing discussion of this item to the later session chaired by Hay.

C.3 Fate of ODP Proposals in Transition to IODP

Klein acknowledged an existing concern among proponents regarding the fate of drilling proposals in the transition from ODP to IODP and identified the need for a general statement by SCICOM. A brief discussion ensued about the exact wording of the statement. Coffin proposed to mention EXCOM because they would receive the motion. Allan noted that the IODP planning document would include a section about the transition strategy and partly cover the issues discussed here. D'Hondt consequently questioned the need for a motion, but all disagreed. Morris reiterated the need to send a signal to proponents that SCICOM regards this as an important issue. Mountain suggested a slight change in the wording and rewrote the motion accordingly.

SCICOM Motion 00-1-5: SCICOM recommends that EXCOM make every effort to ensure that active ODP proposals carry forward to the IODP, with SSEP groupings and SCICOM rankings clearly reported. SCICOM recommends that these documents form a basis for initial programming in the IODP.

Wiens moved, Klein seconded; 15 in favor.

C.4 Reviewers for IODP Initial Science Plan

Coffin noted that Moore had asked SCICOM to provide a list of about ten persons who could serve as external reviewers of the Initial Science Plan. Rea read a statement that EXCOM had asked him to write and deliver to SCICOM. The committee then compiled an international list of possible reviewers for the latest version of the IODP Initial Science Plan.

C.5 ODP Greatest Hits, Vol. II

Coffin reported on the proposed ODP Greatest Hits, Volume II and said that Hay had suggested considering only ODP, not DSDP. Bloomer asked about the purpose of such a volume. Coffin replied that the purpose remained the same as for Volume I, which had received criticism only for its lack of an international scope. Ludden suggested that Volume II should have come out two years ago, and he questioned the need for it now. Coffin agreed and added that the Initial Science Plan included a summary of about thirty achievements of DSDP and ODP. Furthermore, the JOI web pages also listed additional ODP achievements apart from those in the Greatest Hits, Volume I. Without a clear understanding of the reasons behind this proposal, Coffin decided to return to it later and adjourned the morning session.

SCICOM/OPCOM Joint Meeting
(Chaired by Coffin and Pisias)

A. Update on Planning for Scheduled Legs
Pisias related the discussion from the morning OPCOM session concerning proposed changes in the planning for Legs 190, 192, 198, and 199.

A.1 Leg 190 (Nankai I)
Pisias reported that the proponents have requested to reprioritize the drilling sites after completing a 3-D seismic survey. The new high-priority sites located further upslope would intersect thrust faults that penetrate the seismogenic zone. At the other high-priority site, WNT-O3B, the revised strategy calls for reducing the amount of time by not worrying about the upper section and instead sampling the expanded section off the frontal thrust. Pisias noted that the proposed changes would not affect the overall amount of time required for Leg 190 and would benefit Leg 196 (Nankai II). OPCOM therefore approved the idea.

Morris asked about the strength of the seismic evidence for a connection between the faults and the seismogenic zone. Pisias replied that as a paleoceanographer he had to trust that the 3-D survey characterized the area very well. Ludden noted that SCICOM had criticized the original plan because it lacked a 3-D component in the upper thrust zone. Wiens said that the problem then had been the missing 3-D seismic data for East Nankai, and he noted that a cruise scheduled for this summer would collect that data. Pisias reiterated that OPCOM viewed the proposed change as quite logical from an operational standpoint. He added that the new plan would not affect operations and appeared to meet the scientific objectives considered in ranking the proposal. Ludden asked if the original proposal included the upper sequence thrust sites and expressed concern that SCICOM might approve science that the SSEPs had not reviewed. Pisias asked whether moving the sites would eliminate any of the originally proposed science. Baldauf replied that the goal of studying the dipping discontinuity sequence on the western transect would depend on the availability of time. Miller said that he would approve the proposed changes but felt uncomfortable with the fact that the seismic information and the new plan had not gone forward to the SSEPs or to SCICOM. He noted that SCICOM in the future should refrain from acting without a written justification. Coffin replied that the system should remain flexible enough to respond if new data comes in. Miller noted that the proponents had enough time to provide SCICOM with this information. Baldauf explained that the issue arose at the last PPSP meeting and Hay had discussed it there.

The discussion then turned to the question of whether this issue should go back to the SSEPs. Morris recalled that the new sites and the remaining old ones would satisfy the science objectives. Robertson felt that such changes should normally go to the SSEPs for review because of major new features, though he suspected that they had to accept the changes this time. When asked if he agreed with the interpretations, Shipley answered that he did not doubt the connection to the seismogenic zone. Miller stressed that he had not questioned the science, but only the procedure, and he suggested endorsing the proposed changes. Coffin noted that Hay had approved the changes, so the question remained whether SCICOM wished to change the procedure in the future. After Hay had joined the meeting, Pisias summarized the OPCOM recommendations and Miller explained the concerns of SCICOM about the suggested changes in the Leg 190 site locations.

A.2 Leg 192 (Ontong Java Plateau)
Pisias noted that the proponents had requested more days for operations and to reduce the amount of logging. Furthermore, the transit time had been miscalculated. OPCOM suggested adding three extra days for the transit but did not see the possibility of adding any more time. They recognized

as priorities to drill basement as deep as possible, to log the basement, and to do this at as many sites as possible. OPCOM recommended letting the co-chiefs decide how to implement the leg science.

D'Hondt expressed concern about saving time during Leg 192 by washing away sediments because he would like to see the environmental effects of Ontong Java volcanism studied. Pisias and Robertson replied that OPCOM saw this as the most reasonable compromise given the main goal of studying the evolution of the basement by means of maximum basement penetration. Under the time limit, they had to look at the leg priorities.

A.3 Legs 198 (Gas Hydrates) and 199 (Equatorial Pacific Paleogene)

Pisias described the switching of Legs 198 and 199 as a purely budgetary issue designed to avoid having three cost-intensive legs in FY2001. Also, a change in the port call from Dutch Harbor to Honolulu would save about $150,000. The switch would give the Gas Hydrates leg a couple more days and the option of one extra reentry site, as well as address the budget problem. OPCOM had raised concerns about the weather window for Gas Hydrates but felt reinforced by the successful operations of Leg 146 in the same area and same weather window. Furthermore, the Gas Hydrates leg includes a logging-while-drilling component that would depend less on weather and could occur near the end of the leg. Given the alternatives, OPCOM viewed the switch as a reasonable solution.

Wiens asked about the alternatives, but Pisias answered that no good alternatives exist without additional money. Rea asked about the number of additional days for the Gas Hydrates leg. Pisias replied that it would add two days, and the Equatorial Pacific Paleogene leg would not lose any operational days. SCICOM members also expressed concern about the possibility of bad weather conditions.

SCICOM Motion 00-1-6: SCICOM adopts the following three changes to the science plan for FY2001 and beyond, as recommended by OPCOM:

1. Leg 190 (Nankai I) will have reprioritized drilling sites as proposed by the co-chiefs.
2. Leg 192 (Ontong Java Plateau) will receive three additional days to correct a miscalculation of transit time. SCICOM recognizes the scientific priorities of drilling basement to at least 150 m and logging basement at as many sites as possible. The co-chiefs may decide the best way to implement this plan and maximize the scientific benefits.
3. Legs 198 (Gas Hydrates) and 199 (Equatorial Pacific Paleogene) will switch places on the schedule to save money on port calls and to move the Gas Hydrates leg into the next fiscal year.

Fryer moved, Miller seconded; 11 in favor, 3 abstain (Coffin, Rea, Tokuyama), 1 absent (Mountain).

B. Other Matters

B.1 SciMP Report

Pisias summarized the report that OPCOM had received from the last SciMP meeting. He noted that SciMP Recommendations 00-1-1 and 00-1-2 pertained to the issue of morale aboard the *JOIDES Resolution*. SCICOM endorsed the first two SciMP recommendations and deferred further discussion of the rest until the full committee met the next day.

B.2 ODP Greatest Hits Volume II (continued from morning session)

Coffin summarized the morning discussion and concluded that a consensus did not exist in favor of pursuing a second volume. A short discussion followed. Ludden still saw it as too late for such a publication. Rea recognized the value of keeping track of ODP publications in major journals. Robertson said it was an omission that they had not been effective with general publicity during the past few years. Moran expressed surprise that SCICOM did not want to pursue this. She said that USSAC had sponsored an intern at JOI to search for ODP science in major journals, and the ODP managers thought that this successful effort should continue. Ludden replied that the IODP

planning document already identified many past highlights, and he did not see how such a volume would help from the international perspective. Fryer agreed with Moran and asked whether anyone else had undertaken similar efforts to form a collection of ODP publications. Srivastava mentioned a meeting in Canada in May to highlight ODP achievements over the last 30 years. Ludden inquired about the JOI list of publications. Moran described it as an Endnote file so far, but added that she could most likely present it at the next SCICOM meeting. Coffin concluded that although SCICOM did not endorse a glossy brochure, they certainly endorsed everything else done in this regard and therefore encouraged Moran to continue linking the achievements of ODP with the Long-range Plan. Coffin added that if national organizations like USSAC strongly support the publication of a glossy brochure, then SCICOM should reconsider this issue at the next meeting. Dauphin said that USSAC had already started looking into this because it would help the planning of IODP to have a document compiling ODP achievements.

B.3 Reviewers for IODP Initial Science Plan

Coffin distributed a list of names for the Initial Science Plan external review board, as compiled during the morning session. He instructed SCICOM members to select their top candidates from the list and suggested making the final decision on the eleven review board members the next day.

Meeting adjourned at 2:50 PM.

WEDNESDAY 16 FEBRUARY PM

EXCOM/SCICOM/OPCOM/PANCH Joint Science Symposium
(Chaired by Hay)

Speaker	*Presentation*
Miller	Global sea-level change: and ODP perspective.
D'Hondt	The influence of biogeochemical cycles on oceans and climate over geological time.
Holm	Formation of organic matter by the reaction between water and rock.
Robertson	Overview of recent tectonics-related drilling results.
Coffin	Notes from deep underground: ODP and mantle dynamics.

Symposium adjourned at 5:00 PM

SCICOM/OPCOM Joint Meeting
(Chaired by Hay)

A. Approval of August 1999 SCICOM Minutes and Matters Arising
Hay called the meeting to order and asked for approval of the minutes from the previous meeting. No other comments or matters arose.

SCICOM Motion 00-1-7: SCICOM approves the minutes of the August 1999 meeting.

Bloomer moved, Robertson seconded; 11 in favor, 1 abstain (Rea), 3 absent (Fryer, Miller, Zachos).

B. Leg Reports
Warren Prell reported on Leg 184 to study the Southeast Asian monsoon history in the South China Sea. One highlight included the recovery of high-resolution drift sediments. Results from these and other samples will provide a continuous environmental history of the SCS from 32 Ma, define the meridional gradients for the last 8 My, and place constraints on the Plio-Pleistocene deep-water ventilation.

John Ludden reported on Leg 185 to study element fluxes and mass balances at the Mariana-Izu convergent margin. They drilled two sites in 160 My old oceanic crust and conducted the first tests of downhole contamination for microbiology. The biology and geochemistry groups worked well together. Pisias asked about an operational issue related to site order. Mountain asked about the reasons for overestimating the sediment thickness by 50% at one site.

Kiyushi Suyehiro reported on Leg 186 to install geophysical observatories along the northern part of the Japan Trench. Installation of the borehole sensors proved technically challenging, but ultimately successful. Another objective involved looking at volcanic records in the upper part of the section. A general discussion followed on the future of borehole observatories.

C. Panel Reports
C.1 TEDCOM Report
Hay presented the TEDCOM recommendations and suggested endorsing them by consensus. Baldauf remarked that TAMU had already acted on some of them.

TEDCOM Recommendation 99-2-1: TEDCOM reaffirms its earlier recommendation that MATLAB simulation studies be carried out as a matter of urgency on the data obtained from drillstring deployments using the passive and active heave compensation systems, downhole measurements of string dynamics, and rig-floor instrumentation.

Hay explained the rationale for learning as much as possible about heave compensation on the *JOIDES Resolution* before going to another vessel in the next program and starting over with a new system. Baldauf noted that TEDCOM has pursued this objective for some time and TAMU hoped to finalize it in the next six months.

TEDCOM Recommendation 99-2-2: TEDCOM requests that, if necessary, a commissioning engineer for the active heave compensation system sail with the vessel on a science leg in order that this development is fully working and available in the shortest possible time.

Baldauf said that a technician would sail on the first ten days of Leg 189 to train the crew and fine-tune the system and would return for Leg 190 to train the other crew.

TEDCOM Recommendation 99-2-3: TEDCOM strongly recommends continuation of funding for development engineering until the completion of the present Ocean Drilling Program.

Hay noted that a question had arisen as to whether to stop development of the ongoing engineering projects that will not see use in ODP. He said that some of those projects could play an important role in the next program, and TEDCOM would regard it as a waste of resources not to complete half-finished projects and then have to start all over again in the future. Hay suggested that perhaps the ODP phase-out plans could include additional funding for completing the most important engineering development projects. Pisias wondered whether TEDCOM and the ODP engineers could specify how to bring those projects to a satisfactory level of completion for handing them off to the next program. Baldauf said that TAMU plans to evaluate the status of the ongoing projects before the next SCICOM meeting. Hay called for a consensus to forward the TEDCOM recommendations and no one objected.

C.2 SciMP Report

Nick Pisias presented the SciMP recommendations forwarded from OPCOM. Hay said that if he did not hear any serious objections to a given recommendation, he would assume that SCICOM approved it by consensus.

SciMP Recommendation 00-1-1: SciMP is keenly aware of, and concerned about, the high risk of significant technical attrition on the *JOIDES Resolution* as ODP approaches its conclusion in 2003. SciMP strongly recommends that JOI and IPSC develop a plan that will assure the preservation of all critical technical skills towards the end of ODP. This plan should be in place and communicated to all ODP staff by 1 January 2002.

SciMP Recommendation 00-1-2: SciMP recommends that ODP-TAMU provide the necessary shore-based training for all ASPP employees in a manner that appropriately compensates them for their time.

SciMP Recommendation 00-1-3: SciMP recommends that ODP-TAMU cease further development of Hard-Rock AppleCore and await a recommendation by the Core Description Lab Working Group on development of a new application.

Klein asked for a description of AppleCore. Pisias identified it as a graphical tool for describing core sections and said that it works well for soft sediment but poorly for hard rocks. Ludden confirmed that AppleCore frustrated the hard-rock petrologists who tested it on Leg 185.

SciMP Recommendation 00-1-4: SciMP applauds ODP-TAMU's decision to purchase a digital imaging system from GEOTEK. Due to the high priority of this measurement on upcoming legs, we reiterate our request that the new GEOTEK system be deployed and operational by June 2000 as specified in SciMP Recommendation 99-2-12 (SCICOM-approved). Appropriate resources should be focused on integrating the GEOTEK line-scan camera into the ODP infrastructure, including deployment of required resources, data storage and archive procedures, JANUS data model, and a post-cruise image distribution plan.

To alleviate space concerns in the post-drydock core lab, the AMST should be removed to provide space for placement of the GEOTEK track. Sensors from the existing AMST should be retained aboard the *JOIDES Resolution* for use by the shipboard scientific party, if needed. No resources should be spent on further development of the alternatives to the GEOTEK line-scan camera system.

Miller asked whether the magnetic susceptibility meter and natural gamma ray sensor would remain on-line with removal of the multi-sensor track. Janecek clarified that the whole-core multi-sensor track and all of its sensors would remain onboard. SciMP recommended removing the archive- or split-core multi-sensor track that includes the Minolta spectrophotometer, now redundant with the

line-scan camera; the point-source magnetic susceptibility unit, which has seen little or no use; and the frame camera, which does not work properly.

SciMP Recommendation 00-1-5: SciMP recommends that ODP-TAMU remove the XRF from the *JOIDES Resolution* during the Leg 189/190 transit and portcall.

SciMP Recommendation 00-1-6: SciMP recommends that TAMU expeditiously (i.e., during the Leg 189/190 transit) move the existing thin-section, hard-rock sample preparation, and XRD laboratories into the new space on the 7th floor of the lab stack. The microbiology laboratory, including the existing apparatus and the expanded apparatus purchased by ODP-TAMU and LExEn, should be installed in the F-deck space vacated by this move.

Pisias said that SciMP recognized a tremendous benefit in reorganizing the lab stack and putting the microbiology and chemistry labs on the same floor. He described the XRF as redundant now that the chemistry lab has a new ICP-ES. He also noted that SciMP intends to discuss further the overall merits and necessity of the shipboard XRD before recommending whether to purchase a new one. Parkes emphasized the benefits of putting the microbiology facilities next to the chemistry lab. Ludden asked what would happen to the old XRF. Baldauf said that it might come off the ship as soon as the next port call in Hobart and would return to TAMU for use in the shore-based lab. Klein asked if SciMP discussed keeping the XRF onboard as a backup to the ICP. Janecek replied that any instrument could malfunction and we cannot keep backups onboard for all of them. Pisias said that TAMU has to remove the XRF to implement this plan.

SciMP Recommendation 00-1-7: SciMP recommends that the pending purchase or lease of the new seismic gun arrays for the *JOIDES Resolution* be deferred pending full evaluation of the *JOIDES Resolution* underway geophysical operations by the SciMP U/G sub-panel. The evaluation will be completed and presented at the next SciMP meeting and a full recommendation on U/G operations will follow.

SciMP Recommendation 00-1-8: SciMP recommends that ODP-TAMU determine the cost to repair both magnetometers and properly maintain and service them for the remainder of ODP. These data will be incorporated into the SciMP evaluation of U/G operations. Any repairs or other expenses should be deferred pending the U/G report.

Pisias noted that the shipboard geophysics systems have aged and deteriorated and SciMP believes that they no longer provide high-quality data. He wondered how many legs really need that equipment on the ship. Janecek added that SciMP saw it as part of a larger issue of overall use of shipboard resources and training of the technical staff. SciMP wants to evaluate the need for geophysics on the upcoming legs and decide whether it makes more sense to outsource this service or have TAMU devote resources to maintain the equipment. Coffin stated that you could not always predict the need for the geophysics equipment and emphasized that at least three of the last six legs had used it. Miller said that he would not want to compromise the success of a whole leg because the ship did not have an underway geophysics capability. He argued that SCICOM should direct SciMP to ensure that we maintain an operational seismic survey system onboard the *JOIDES Resolution* for the remainder of the program. Robertson agreed, saying that it could prove disastrous for a leg to have seismic capability only if deemed necessary in advance. Prell doubted whether SCICOM would have even scheduled Leg 184 without shipboard geophysics because of the necessity to obtain seismic crossing lines during that leg.

Bloomer imagined that some sites might have sufficient 3-D seismic data for selecting several good alternate sites in advance, and he saw it as reasonable to ask whether we could conduct shipboard geophysics in a more efficient and economic way. Pisias stressed that SciMP had not recommended

removing the geophysics equipment, but only determining whether we could provide this service as needed without an expensive upgrade of equipment. Coffin said that the proponents of Leg 183 thought they had the best possible seismic data in advance, but they still needed to use the shipboard geophysics systems to select alternate sites. Wiens predicted that if ODP contracts for this service on a leg-by-leg basis, then budget discussions would inevitably arise about saving money, and a particular leg might not have the capability for underway geophysics when they need it.

Moran stated that the *JOIDES Resolution*, although not a seismic vessel, must maintain some level of seismic capability to ensure that every leg has the utmost chance of success. She noted that the seismic equipment works now, though perhaps not perfectly, and she expects to receive the advice from SciMP to decide if it needs upgrading or not. Moran characterized the SciMP recommendation as appropriate given their responsibility to evaluate the shipboard equipment and ensure that it meets the program needs. Austin saw the issue as not just about equipment but also about having the trained staff needed to use the equipment. Pisias repeated that SciMP recommended investigating the staffing needs. Allan asked if the concerns centered on improving the system or maintaining it. Pisias described it as a matter of maintaining an aging system. Baldauf added that TAMU just wants to assess the current situation and develop a suitable plan. Austin suggested assessing the role that underway geophysics has played over time in the existing program. Janecek said that later SciMP recommendations would address that issue.

Mountain wondered whether SCICOM could add to the SciMP recommendation to convey the points raised here about the importance of keeping the capability for both equipment and staff. Hay said that the minutes would convey that concern. Coffin asked how long the GI gun purchase had been deferred. Moran said that it had been deferred for a long time, perhaps eight years. Pisias said that the issue of providing this service through a contractor and making budget decisions implies setting priorities and identifying where you want to take risks. Moran noted that the co-chief reviews had not mentioned anything about inadequate provisions for geophysics; therefore, she viewed the SciMP recommendation as an appropriate way to proceed. Pisias summarized the discussion by suggesting that SCICOM agree to proceed with the recommendations on underway geophysics, but with the recognition of a strong desire to maintain this capability on a continuous basis. Mountain still wanted to add to the recommendation that TAMU should do everything possible to maintain the proper personnel. Janecek said that the SciMP minutes include a discussion of the personnel issue. Pisias confirmed that SciMP recognizes that you cannot separate the personnel and equipment issues, and he added that personnel always cost more in the long term than equipment.

SciMP Recommendation 00-1-9: SciMP recommends that:

1) Shipboard facilities for seismic/log/core integration include a separate workstation dedicated to this effort.
2) The IESX software be able to plot directly to large-scale (36") plotters and printers and that this capability be implemented by the June 2000 SciMP meeting.
3) ODP-LDEO and ODP-TAMU provide a plan for integrating the Unix network on the ship.

SciMP Recommendation 00-1-10: SciMP recommends that LDEO develop a procedure for creating IESX project files for each ODP drill site that will include the digital seismic profiles so that these data can be visualized interactively with the log and core data during and after the drilling of each site. The project file should be the basis for the seismic/log/core integration and time-depth conversion capabilities defined in SciMP Recommendations 99-1-11 and 99-1-12 (SCICOM-approved).

SciMP Recommendation 00-1-11: SciMP recommends that LDEO also create a tutorial and training project file with seismic/log/core integration for the shipboard "cookbooks" so that technicians and scientists can improve their skills with IESX, GEOFRAME, and the integration process while at sea. This training project and documentation should be available for SciMP review by June 2000.

Goldberg briefly described an ongoing pilot project at LDEO to develop shipboard software for integrating seismic, logging, and core data. The new system should prove useful, for example, in relocating drill sites during a leg using pre-cruise seismic data. Diebold asked about the possibility of having a mirror site at TAMU to allow for independent evaluation. Goldberg saw that as a data issue rather than a software issue. Mountain asked who would prepare and upload the project files to the ship. Goldberg expected that a shipboard scientist could bring the necessary project files to the ship and do the work.

SciMP Recommendation 00-1-12: SciMP recommends that JOI modify the site-survey data requirements for seismic profiles in the Data Submission Guidelines (DSG). The modification will include the following:

(a) For each final processed seismic profile submitted with a proposal, digital seismic data and navigation data and supporting documentation of the processing stream used must be provided to the data-bank manager in industry standard SEG-Y format on 8-mm tape. The data-bank manager will advise the appropriate SSEP when these data are received. This data submission requirement should be rigorously enforced and proposals should not be considered for scheduling by OPCOM until this requirement is met.

(b) The data bank manager will maintain the digital seismic data and support documentation, and these data will be treated as ODP proprietary information as specified in the current DSG.

Pisias explained that SciMP wants to develop new data submission guidelines that address the issues of handling proprietary data and requiring proponents to submit digital seismic data. He identified the current lack of digital seismic data and the lack of a requirement to submit such data as a major problem in expanding the LDEO pilot project. Diebold confirmed that no requirement exists for submitting digital data, although the site-survey databank has the capability to receive and display it. D'Hondt expressed concern about requiring digital data before considering a proposal for scheduling. He imagined that certain new legs might not need new seismic data if sufficient data already existed from a previous leg in the same area, and he wondered whether all old seismic data met the current standards.

Shipley recalled that OPCOM agreed to table this recommendation and not present it to SCICOM before seeing the results of the LDEO pilot project. Pisias acknowledged the premature status of the recommendation, but said that it would ultimately come back to SCICOM once SciMP had settled the details of how to submit data. Moran suggested viewing the need for data integration as another approach for a leg rather than as an essential requirement. Pisias believed that if data integration comprises an integral part of a leg, we would eventually have to require the proponents to submit digital data. Mountain asked about the need for specialists to maintain this type of data at the databank. Pisias saw that as a major issue, and Goldberg said that LDEO wants to evaluate that as part of the pilot project. Coffin noted that the new requirements would only apply to the last few legs of drilling, but he saw this as an important exercise in preparing for IODP. Hay asked for the final OPCOM opinion. Pisias said that OPCOM just wanted to inform SCICOM for now. He expected that SciMP would forward a revised recommendation to OPCOM once they review the results of the pilot study.

SciMP Recommendation 00-1-13: SciMP recommends that ODP-TAMU investigate the capability to measure spatial variations in core temperature on the catwalk. These non-intrusive measurements should lead to integration into JANUS and should be coupled to measurements made in the physical property laboratory. The results of this investigation should be presented to SciMP before ODP-TAMU purchases or develops any equipment.

Pisias explained that the need for determining core temperatures applies principally toward designing a strategy for rapidly detecting and sampling gas hydrates on the catwalk. Possible methods range from simple temperature sensitive tape placed along the outside of the core liner to a sophisticated infrared video system that would provide a whole-core image.

C.3 SSP Report

John Diebold noted the difficulty of mandating the need for digital seismic data because many good analog data already exist. He said that the databank sometimes receives adequate data, but they always like to receive better data. Diebold believed that it would cost too much to have contractor for shipboard geophysics. Diebold reported on upcoming rotations of SSP panel members and noted that SSP faces a greatly increased workload with so many legs now scheduled and so many proposals in the system. Morris asked whether the SSEPs could do anything that would help SSP. Diebold said that it would help if the SSEPs could amplify the concerns of SSP to proponents.

C.4 PPSP Report

Jack Baldauf reported briefly on the PPSP meeting in December 1999. He said that advance preparation had begun for selecting alternate sites for Leg 194 because of a possible problem getting clearance in Great Barrier Reef National Park. PPSP also previewed the Hydrate Ridge program.

C.5 SSEPs Report

Neil Lundberg and Julie Morris summarized the events of the SSEPs meeting in November 1999. Lundberg noted foremost that the submission of new pre-proposals in October 1999 indicates that proponents continue to look ahead to the new program. He reported that the SSEPs have formed joint working groups to review cross-disciplinary proposals in gas hydrates, microbiology, the seismogenic zone, and climate-tectonics links, and they would probably form another working group for oceanic lithosphere proposals. Morris stressed the importance of maintaining continuity for proposals through the transition to the new program. She believes that some proponents have started feeling anxious because they fear that politics might begin to play a more important role in the fate of their proposals as the current program approaches its end. Morris thanked the former SSEP chairs, John Tarduno and Ted Moore, for establishing smooth operating procedures, but expressed regret that about half of the SSEP members had rotated off the panels between the fall and spring meetings. Lundberg suggested that in the future the SSEP chairs should not rotate at the same time. (Ed. note: Lundberg and Morris began their terms as SSEP chairs after the May and November 1999 meetings, respectively.)

Lundberg noted that the SSEPs devoted time at their last meeting toward reviewing the special issue of combining the proposals for Marion Plateau and Shatsky Rise into one drilling leg. The SSEPs also heard reports from the Shallow-water Systems and Gas Hydrates PPGs and named liaisons to the new PPGs for Hydrogeology and the Arctic's Role in Global Change. Julie Morris said that the revised Terms of Reference for PPG liaisons should help to improve communications, and it would help further if all of the PPGs posted their minutes on the web and passed them along to the SSEP chairs. Paull suggested that the PPGs might have posted more material on the web if a formalized process existed for submitting such material.

Mountain asked if the SSEP members saw the proposals before they arrived at the meeting. Morris said yes, the SSEP chairs receive the proposals from the JOIDES Office and distribute them to the

panel members two to three weeks before the meeting. Mountain asked how many proposals each SSEP member had to handle, and Morris answered typically five to eight. Lundberg added that he would not mind if they could distribute at least some proposals electronically. Miller suggested distributing all proposals electronically to panel members and having, say, six complete sets of hardcopies available at the meeting for all to share. Lundberg said that proponents must now submit text electronically, but figures pose more difficulty. Austin suggested distributing figures on a CD-ROM. Hay commented that AGU encourages electronic submission of abstracts by extending the deadline a few days past that for paper submissions.

Morris noted that the SSEPs will hold their next meeting in Cambridge, England, with observers from the U.K. ODP community, an observer from the International Continental Drilling Program (ICDP), the two new PPG chairs, and perhaps extra non-voting U.S. members in attendance. The SSEPs also plan to hold a town meeting with the U.K. ODP community. Robertson mentioned the need to focus on science presentations for the town meeting and not organizational structures. Coffin asked whether any extra international members would attend the next SSEP meeting. Lundberg replied that it might happen.

D. Seismogenic Zone DPG Final Report

Roy Hyndman delivered the final report of the Seismogenic Zone (SEIZE) DPG, first listing the membership, mandate, and meeting history of the group. He described the scientific objectives defined by SEIZE and some of the criteria identified for selecting drill sites. Hyndman characterized the seismogenic zone as a topic of particularly acute concern in Japan and said that its study requires the OD21 capability for deep drilling, extensive downhole measurements and experiments, and long-term monitoring. Hyndman also suggested that seismogenic zone drilling would require a very different advisory and management structure than ODP, perhaps with a small oversight committee and larger subcommittees for various aspects of each project. Coffin thought that IPSC should receive the SEIZE DPG report and Hay agreed.

Fox asked whether one deep drill hole, rather than a family of holes, would adequately solve the problem. Hyndman said that multiple holes would certainly provide more answers than a single isolated hole. Fryer asked what it would require to drill multiple sites. Hyndman said that a complete picture requires a transect through a well-surveyed and well-studied region with simple earthquake, tectonic, structural, and thermal regimes. Other site requirements would include 1) a shallow trench and subduction angle, 2) accessibility by riser and non-riser drilling, 3) a recent great earthquake that ruptured within study area, 4) good seismic images of the subduction thrust, and 5) a well-defined seismogenic zone on the thrust. D'Hondt asked what temperatures they expected to encounter. Hyndman said that temperatures would reach 100-150°C. Wiens asked about the timeframe for extending the depth capability of riser drilling. Dauphin said that industry had already drilled more than 8000' deep and expected to go deeper. Wiens then asked if the depth limit reflects an engineering problem. Pisias answered yes, until you reach the fracture pressure of the mud column. Robertson asked whether the SEIZE DPG considered existing proposals. Hyndman replied that all existing proposals concern non-riser drilling through only the aseismic zone, and he cautioned that the new ship could still only reach the shallow subduction zone because of its initial 2500 m riser limit. Wiens mentioned the uncertainty of how far the seismogenic zone extends toward the trench. Hyndman replied that it extends to somewhere between 0-100 km of the trench. Suyehiro hoped that data acquired from ongoing surveys would answer that question. Tokuyama asked why the décollement dips at different angles on East and West Nankai. Hyndman confirmed that a difference exists but did not know why.

E. PPG Final Reports:

E.1 Architecture of the Oceanic Lithosphere

Charlie Langmuir stated that the AOL PPG made substantial progress in focusing on existing drilling proposals, but their mandate perhaps did not allow enough time to accomplish all goals for developing a drilling program. He diagrammed the processes of ridge magmatism and crust formation, explained the concepts of focused and distributed mantle upwelling and melt migration, and compared the processes and products at slow and fast spreading ridges. The PPG believes that existing technology can address many inherently important problems such as fluid circulation in ridge systems.

D'Hondt asked if all of the interesting objectives involve ridge crests. Langmuir said that other objectives involve troughs and transform faults and obtaining a complete section of crust away from the ridge. Bloomer asked if the PPG struggled with a strategy or order, say mantle before lower crust. Langmuir said that some of the PPG members wanted to set priorities, but others wanted to work at strengthening existing proposals. Bloomer said that the SSEPs and SCICOM would welcome guidelines from the PPG on how to make good decisions in judging these proposals. Morris added that the PPG did a good job of developing proposals, but she agreed that it would help to have criteria for judging them. Langmuir mentioned one problem of not having site surveys and magnetic surveys conducted in exactly the same place. Morris said that it definitely would help other advisory groups if the PPG could identify such issues.

Ludden saw it as a weak point in the IODP Initial Science Plan to propose drilling a complete section of oceanic crust in 2500 m of water when such a site might not exist. He would advise waiting for the deeper capabilities of the riser ship. Langmuir conceded that perhaps the PPG had not addressed that issue sufficiently. Fryer asked if the PPG had an opinion about using offset drilling rather than trying to obtain a whole section in one hole. Langmuir saw offset drilling as a good alternative strategy, but not a sufficient substitute for obtaining an intact section from a single hole. Robertson mentioned the relationship between ophiolites and normal oceanic crust, but Langmuir said that the PPG did not consider marginal basins. Allan asked if the PPG discussed the diamond core barrel and how it would help drilling at some of these sites. Langmuir said no. Janecek asked if they identified any other shipboard needs not available now. Langmuir said that he would mention that idea to the PPG and try to have it addressed in the final report.

E.2 Climate and Tectonics

Jim Wright reviewed the mandate of the Climate-Tectonics Links PPG and said that they divided into two subgroups for gateways and continental tectonics, with only the chair participating in both subgroups. As general topics of future research, the PPG recommended studying 1) the effects of orographic changes on climate, either directly or indirectly via CO_2, 2) the role of ocean gateways in redistributing heat, and 3) the role of oceanic ridges and plateaus in modifying atmospheric CO_2. They also recommended specific regions and topics of study, distinguishing their goals between the current and future drilling programs. Wright said that the PPG expressed concern that certain priorities would require more than a single drilling leg. They also identified the need for enhanced interactions between scientists studying the marine and terrestrial realms, improved recovery of sedimentary fan deposits, and improved estimates of past atmospheric CO_2 variability.

Klein asked what types of indicators those who favor Arctic drilling want to study. Wright said that they wanted to look for changes in sedimentation, but he did not know how they would date such changes. Janecek asked if the PPG anticipated any requirements for downhole measurement capabilities. Wright said that they did not consider that issue. Robertson thought that the PPG had not clearly recommended exactly how and where to proceed.

E.3 Gas Hydrates

Charlie Paull outlined the approach taken by the Gas Hydrates PPG. He said that they endorsed an end-member strategy for developing and selecting proposals for drilling, and they regard the Hydrate Ridge leg already scheduled by SCICOM as a cornerstone for future efforts. Issues not addressed by that leg include a) slope failure and its effects on climate, b) natural climate related perturbations in gas hydrate distributions, c) drilling in an active hydrocarbon provenance, and d) gas hydrate distribution away from BSRs. The PPG also reviewed the status of existing technology for detecting and sampling gas hydrates and found it inadequate. They identified a need for allocating funds to build and use the necessary hardware, noting that it takes dedicated space and engineers to run PCS tools. The PPG views HYACE as a complement to PCS, not a competitor of it, and they see CORK experiments as appropriate for gas hydrate research.

Fryer recognized the importance of preserving samples, but she expressed surprise at the lack of a recommendation for borehole monitoring, given the sensitive nature of gas hydrate stability. Paull said that proper borehole experiments would require a lot of thought because of the difficulty in obtaining robust data. Becker explained that CORKs work well for characterizing *in situ* conditions and properties away from BSRs, but not for capturing transient phenomena. Paull added that the drillship might not provide the best means for looking at seafloor occurrences of gas hydrates. Parkes wondered if the Hydrate Ridge proposal had covered microbial processes well enough. Paull noted that geomicrobiology exists in the absence of gas hydrates, but not vice versa. D'Hondt suggested that microbiologists should submit an ancillary program letter for the Hydrate Ridge leg. Tokuyama mentioned that the Japan National Oil Corporation succeeded in recovering gas hydrates at eastern Nankai.

E.4 Deep Biosphere

John Parkes reviewed the goals, mandate, and meeting history of the Deep Biosphere PPG and summarized recent research on bacterial processes in marine sediments. He also presented new data on bacterial counts from Leg 185 and hailed the success of the contamination tests. D'Hondt noted that the shipboard microbiology work on Leg 185 focused primarily on the contamination tests, with much other work planned by shorebased investigators. Hyndman wondered if any sites exist with an established upward fluid flux that bacteria could utilize. Parkes said yes, and such a flux can cause an increase in bacterial populations at depth. He then showed evidence from a previous ODP leg for the presence of bacterial populations at temperatures of 175-200°C in a mixing zone between different subsurface flow regimes. Parkes said that ODP does not necessarily need to target a specific leg for deep biosphere studies but rather get equipment in place for routine use. He argued for staged implementation of shipboard analytical techniques and added that routine does not mean that anyone can do it.

Klein asked Parkes about special techniques from his laboratory that would work well on the ship. Parkes commented on the value of patience and training at using small samples and extensive field-of-view assaying experience. Diebold asked what nonbiological measurements would prove most helpful to microbiology studies. Parkes said that microbiologists would like to know where to sample based on geochemistry and fluid flow, but they do not really need any new types of measurements at the moment. Allan asked if the PPG report addresses shipboard use of radioisotopes. Parkes noted that the PPG has not yet produced its final report, but they do expect eventually to use radioisotopes in a separately contained facility onboard the *JOIDES Resolution*. Tokuyama asked about the proportion of total sedimentary organic carbon contained in bacteria. Parkes explained that bacteria account for only a small amount of carbon because of their small size and high water content.

Srivastava asked about plans to publicize further involvement of microbiology in ODP. Parkes replied that progress had occurred on several fronts and he felt certain that the available

opportunities would generate considerable interest. Moran downplayed concerns about getting microbiologists interested in ODP because of the competition already witnessed for shipboard participants. Parkes said that the PPG expects to see a microbiological component in many drilling proposals as well as scheduled legs, and they believe that ODP therefore needs continued input from microbiologists. Hay appointed a small subcommittee consisting of Holm, D'Hondt, Bloomer, and Lundberg (SSEP liaison) to work with Parkes in establishing a group for providing continuing advice on microbiology.

F. OPCOM Report
See item C.2, SciMP report.

G. SCICOM Subcommittee Report
No issues came forward for further discussion.

H. Time and Place of Next Meetings
Shiri Srivastava of the Canadian ODP Secretariat will host the next SCICOM meeting on 1-4 August 2000 in Halifax, Nova Scotia. Wang Pinxian will host the winter 2001 meeting in Shanghai, China, and Steve D'Hondt offered to host the summer 2001 meeting in Puerto Rico.

I. Other Matters
Hay presented the following draft motion from EXCOM regarding conflicted SCICOM members and the voting and ranking procedure.

EXCOM Motion 00-1-7
EXCOM advises the JOIDES office to ensure that a non-conflicted alternate member replaces, for the relevant business, any SCICOM member with a conflict of interest on a drilling proposal considered by SCICOM.

SCICOM members asked about various details. Rea mentioned a concern about distribution of expertise among the alternates. Wiens asked if this applied to proposals excluded from ranking because their study areas lie far removed from the likely ship track. Morris suggested forwarding the SSEPs grouping of proposals by theme to the national committees for consideration in choosing alternates.

Meeting adjourned at 6:00 PM.

9.2 Ship track for the *JOIDES Resolution* through September 2003

EXCOM approves the four-year ship track each year. Now, however, there are only slightly over three years remaining in the program, and the ship is scheduled through late 2001, leaving only about 1 and ½ years to schedule.

The following two motions define the ship track until the end of the program, albeit in very general terms:

SCICOM Motion 98-1-11
In order to fulfill the objectives of the LRP and t respond to existing proposals, SCICOM establishes that the general ship track for the *JOIDES Resolution* will remain in the Indian and Pacific oceans through FY '01. SCICOM anticipates that the ship will return to the Atlantic Ocean prior to the end of Phase III.

SCICOM Motion 99-2-23
SCICOM resolves that the *JOIDES Resolution* will operate in the Atlantic Ocean during at least part of 2002.

These motions were deliberately vague to allow OPCOM and SCICOM maximum flexibility in scheduling the remaining legs of the program to maximize achievement of the goals of the Long Range Plan.

Suggested motion:

EXCOM approves the general ship track until the end of the program as outlined in SCICOM motions 98-1-11 and 99-2-23.

Executive Summary

Ocean Drilling Program Organization

The Ocean Drilling Program (ODP) is an international partnership of scientists and research institutions organized to explore Earth's history and structure as recorded in the ocean basins. ODP provides sediment and rock samples (cores), shipboard and shore-based facilities for the study of these samples, downhole geophysical and geochemical measurements (logging), and opportunities for special experiments to determine *in situ* conditions beneath the seafloor. ODP studies lead to a better understanding of plate tectonic processes, Earth's crustal structure and composition, environmental conditions in ancient oceans, and climate change.

ODP is funded by the US National Science Foundation (NSF) and by international partners, which currently include: the Australia/Canada/Chinese Taipei/Korea Consortium for Ocean Drilling, the European Science Foundation Consortium for Ocean Drilling (representing twelve countries), France, Germany, Japan, the United Kingdom, and the People's Republic of China. The ODP Council, representing all of these partners, provides a forum for consultation among the NSF and other national funding agencies.

Scientific advice for ODP is provided by the Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES), an international organization of advisory committees and panels. The scientific basis and justification for ODP is documented in the report on the Conference on Scientific Ocean Drilling (COSOD) held in November 1981. The COSOD report identified twelve major scientific themes around which JOIDES continues to develop specific drilling plans. The report of a second COSOD meeting (COSOD-II) held in July 1987 provides the framework for scientific ocean drilling through the 1990s. The ODP Long Range Plan (LRP), published by Joint Oceanographic Institutions, Inc. (JOI) in 1990, distills COSOD themes, JOIDES panel white papers, and other scientific and technical advice into a scientific and engineering road map through 2002. The latest ODP Long Range Plan, published in 1996, updates and extends the 1990 Long Range Plan to provide a vision into the next century.

Overall program management is provided by Joint Oceanographic Institutions (JOI). JOI contracts with Texas A&M Research Foundation (TAMRF) to serve as Science Operator and with Lamont-Doherty Earth Observatory (LDEO) to serve as Logging Operator and also to provide Site Survey Data Bank Services. The Science Operator is responsible for operation of the drillship *JOIDES Resolution* and associated activities of cruise staffing, logistics, engineering development and operations, shipboard laboratories, curation and distribution of core samples and data, and publication of scientific results. The Logging Operator is responsible for providing a full suite of geophysical and geochemical logging services, involving acquisition, processing and interpretation of logging measurements. The Site Survey Data Bank prepares safety packages for pre-cruise review of designated sites, and supplies each shipboard scientific party with the geophysical data necessary to properly conduct scheduled drilling cruises. The Data Bank also assists scientists interested in writing/revising ODP proposals by providing information in regards to scientific problems of interest to the scientific ocean drilling community.

Coordination of the ODP Program Plan

Primary scientific programs are based on proposals submitted by the international science community to the JOIDES Office. The reviews and implementation of these program proposals are completed by various JOIDES advisory panels which make recommendations to the JOIDES Science Committee (SCICOM). From this input, SCICOM writes a science plan and submits it to JOI. JOI prepares the program plan from the science plan with budgetary input from subcontractors. If necessary, JOI organizes a meeting of the JOIDES Budget Committee (BCOM), a subcommittee of the Executive Committee (EXCOM). BCOM includes representatives from EXCOM and SCICOM and acts on their behalf in advising JOI about the degree to which the budget outline meets the stated scientific objectives of ODP for the next fiscal year. The program plan is reviewed by EXCOM and forwarded by JOI to NSF for formal approval.

Highlights FY 99 to 2000 (Legs 185 – 188)

Science Highlights

Between 12 April 1999 and 12 March 2000, the *JOIDES Resolution* drilled first in the western Pacific, in the Mariana-Izu region, and then emplaced two geophysical observatories near the Japan Trench before going into drydock. After drydock, the *JOIDES Resolution* operated in the Southern Ocean, first on the Southeast Indian Ridge between Australia and Antarctica, and then in the region of Prydz Bay, Antarctica. Legs 185-188 covered four very different topics. Leg 185 was concerned with the processes of chemical differentiation involved in subduction. Leg 186 was a contribution to development of the ION marine seismic network. Leg 187 explored the nature of the geochemical and physiographic boundary between Pacific and Indian Ocean mantle along the Australian-Antarctic discordance. Leg 188 attempted to determine the time of onset of widespread glaciation in East Antarctica.

The Subduction Factory

The seafloor formed at ridge axes, subsequently altered by interaction with hydrothermal fluids and cold sea water and covered by a blanket of sediments, is fed into subduction zones at convergent margins. Here it is mixed with mantle, and transformed into volcanic, fluid and gas products on the over-riding plate. The term " Subduction Factory" has recently been coined to describe this recycling process. By mass balancing the tracers, and measuring chemical fractionation that occurs between them, we can begin to understand how the factory works and affects Earth's evolution. The aim of Leg 185 of the Ocean Drilling Program was to core two sites in Mesozoic crust in the Mariana-Izu-Bonin region of the western Pacific, and so determine inputs into the western Pacific subduction factory

Leg 185 results bear directly on the problem of the forcing functions on the subduction factory output, and the volatile cycle through the factory. Forcing functions include convergence vectors, thickness of the upper plate, slab temperature, and sediment transport to depth. The Izu-Mariana margin was a particularly good area to examine these functions because of the large geochemical signal along-strike in the volcanic arc. There are significant differences in Ba/Na observed in the basalts formed in the Izu-Bonin and the Marianas systems. Similarly Pb-isotope variations are strikingly different and probably controlled by the sediment input to the system. The volatile emissions (H_2O, CO_2, SO_2 and Cl) from arc volcanics derive from the basaltic portion of the downgoing plate and the

subducted sediments, but this volatile input is virtually unknown for any convergent margin. Results from study of samples taken on Leg 185 will demonstrate how alteration zones and carbonate veins are organized in ancient fast-spreading crust, and so enable the first estimates for volatiles in the upper oceanic crust and sediments near a subduction zone. It will then be possible to compare these estimates directly to volcanic and fore-arc volatile outputs.

The oldest oceanic crust on Earth is subducting into the Izu-Mariana arc system, and in addition to providing geochemical data to input into the subduction equation, the two sites studied provide important constraints on the nature and history of Mesozoic ocean crust. Site 801 is in the Pigafetta Basin, which is in the Jurassic Quiet Zone (JQZ) and dated as approximately 170 Ma. It is the oldest crust drilled by ODP or the Deep Sea Drilling Project (DSDP). The second site, Site 1149 in the Nadezhda Basin, is on the same flow line as Site 801 but is on magnetic Anomaly M11 and has an estimated age of approximately 135 Ma. Both sites originated at spreading centers in the Southern Hemisphere and then migrated northward, but at different times and durations. Thus, in addition to the "Subduction Factory experiment," Leg 185 scientists had an unparalleled opportunity to assess the equatorial sedimentation history of the Pacific Ocean since Mesozoic time, to place limits on the ages of the oldest magnetic anomalies in the ocean basins, and to study the nature of the JQZ.

Emplacement of a geophysical observatory

The scientific importance of cooperation with the International Ocean Network (ION) program for establishing long-term geophysical stations in deep oceans has been recognized in the ODP Long Range Plan. Many important inferences concerning the dynamics of the Earth's deep interior have been based on seismic tomographic images, including the existence of super plumes, deep continental roots, stagnation of subducting plates within the mantle, and variations in the thickness of the thermal boundary layer at the base of the mantle.

A major step forward toward understanding the processes driving Earth's dynamics is being made by installing permanent observatories in the ocean basins, which constitute 71% of Earth's surface. Obtaining observations from oceanic areas is significant not only for global coverage, but because most of the plate boundaries exist beneath the oceans, particularly those boundaries where oceanic lithosphere is being generated and recycled.

Leg 186's goal was to monitor strain and seismic activity continuously, to understand how plate motion is accommodated across a subduction zone, and to contribute to the better imaging and understanding of the mantle. As a result, Leg 186 installed two borehole geophysical observatories approximately 1100 m below the seafloor on the deep-sea terrace of the Japan Trench. Sites 1150 and 1151 are located in areas with contrasting seismic characteristics. The northern site (1150) is in a seismically active zone where microearthquakes are frequent and M7 earthquakes recur. The southern site is within an aseismic zone where no earthquakes are observed. These features coexist within the seismogenic zone of the Japan Trench plate subduction zone, where the >100-Ma portion of the Pacific plate is subducting at a fast rate (approximately 8 cm/yr) beneath northern Japan causing major earthquakes along the trench. The difference in dynamic nature of the subduction seismogenic zone along the Japan Trench remains unexplained because no geodetic and few seismic stations exist on the seafloor to provide data in the vicinity of the décollement. Leg 186 was the first time that state-of-the-art strain, tilt, and seismic sensors for long-term operation have been installed in seafloor boreholes. The borehole instruments were emplaced only 10 km above the gently dipping (< 5°E) plate boundary. The systems

started collecting data in September 1999 and is serviced by a remotely operated vehicle (ROV) at least once a year to recover continuous high-sampling rate and wide dynamic-range data.

Once sub-seafloor geophysical observatories like those on Leg 186 are established, ways and means to recover the data and to keep the station running become necessary. Such tasks are not easily undertaken even if a site needs servicing only once a year. A new fiber-optic cable owned by the University of Tokyo already exists and currently terminates near Site 1150. Once Site 1150 has been demonstrated to be functioning properly, connections will be made to supply power, send commands, and retrieve data in real time on land. A 50-km cable extension is planned to connect Site 1151 with the shore as well. These stations will make invaluable additions to the existing geophysical network over the western Pacific. The data will eventually become accessible worldwide through the Internet.

Examining the boundary between the mantle domains underlying the Pacific and Indian Oceans

The Australian-Antarctic Discordance (AAD) is a deep region centered on the Southeast Indian Ridge between Australia and Antarctica. Among its unique features is an unusually sharp boundary between the ocean-basin scale upper mantle isotopic domains of the Pacific and Indian Oceans. Its anomalous depth reflects the presence of both unusually cold underlying mantle and thin crust. The trend of this depth anomaly forms a shallow west-pointing V-shape cutting across the major fracture zones that currently define the eastern AAD segments. This V-shape implies that the depth anomaly has migrated westward at a long-term rate of approximately 15 mm/yr, much slower than the recent migration rate of the isotopic boundary. The depth anomaly may, in fact, have existed well before continental rifting began approximately 100 m.y. The presence of restricted sedimentary basins on both continents suggests that precursors of the present AAD may have existed for as long as 300 m.y.

The Leg 187 drilling was able to define the configuration of the Indian/Pacific mantle isotopic boundary. In addition to its importance as a "local" phenomenon, an improved understanding of this boundary is important for a broader general understanding of the oceanic mantle. Investigating the origins of the AAD and the isotopic boundary should also increase understanding of variations in geochemistry, isotopic makeup, temperature, and other physical characteristics of the oceanic upper mantle in general. Improved knowledge of the distribution of these chemical and physical characteristics in space and time will lead to a better understanding of the dynamics of the oceanic mantle and of its interaction with the magmatic processes of the mid-ocean ridge system.

Leg 187 demonstrated that the isotopic mantle boundary is closely associated with the depth anomaly. The alternative hypotheses, that the boundary is associated with the transform boundaries of the AAD, or that the boundary migrated rapidly leaving a V-shaped "wake," appear to have been effectively ruled out. Based on the Ba-Zr data, however, it is not possible to draw a simple line that separates an Indian province from a Pacific province. This is neither surprising nor unexpected for two reasons: 1) the present day sharpness of the boundary may be transient, and 2) the recent migration of the boundary may be just one of a series of transient, ± 100 km rapid oscillations about a mean position.

The shipboard scientific party was able to recognize a line that marks the eastern limit of identified Indian-type sites; the -500 meter contour of the depth anomaly. This contour tracks southward to coincide with the physiographic terrain boundary that follows the

mantle boundary from zero-age to approximately 5 Ma. West of this line is a zone in which both Indian and Pacific mantle sources occur in close proximity to one another. It is assumed that this mixed region coincides with the depth anomaly, but its western boundary is not constrained.

The onset of glaciation in the Antarctic

Prydz Bay, East Antarctica, and its adjacent continental rise is a key area for understanding the history of Antarctic glaciation. It is the downstream end of the Amery Ice Shelf-Lambert Glacier ice drainage system, which drains about 22% of the East Antarctic ice sheet. The Lambert Glacier responds to fluctuations of the interior of the East Antarctic ice sheet that are then reflected in the sediments of Prydz Bay. Included in the drainage basin are the Gamburtsev Subglacial Highlands, which may have been the nucleus of the earliest Antarctic glaciation. The underlying structure of the Lambert Graben has focused drainage into Prydz Bay at least since the Mesozoic. Early glaciers would have delivered sediment into the bay and later ice expansion would have caused the glaciers to flow into the bay, making it an excellent place to detect the earliest Cenozoic glacial sediments reaching the Antarctic shelf.

Leg 188 drilled three sites in the Prydz Bay region, recovering sediments that may give a much more detailed account of the glaciation of the continent than hitherto available. The first site, 1165, was situated on the continental rise offshore from Prydz Bay. It targeted mixed sediment-drift, channel-levee sediments of the central Wilkins Drift, an elongate sediment body formed by the interaction of sediment supplied from the shelf and westward flowing currents on the continental rise. Drilling recovered a composite 1000 m thick sedimentary section, through Pleistocene to lower Miocene strata with only a few minor disconformities (<2 m.y.). The number of ice-rafted clasts decreases downhole and isolated lonestones become rare below 500 mbsf. This suggests a significant change in the sediment-delivery system, possibly caused by a retreat of the Lambert Glacier and more temperate climate conditions in the Prydz Bay area in early Miocene time. The second site, 1166, was situated on the Prydz Bay continental shelf on the south-western flank of Four Ladies Bank, about 40 km southwest of ODP Site 742. A limited set of cores was recovered, but these record brief segments of the history of Antarctic paleoenvironments possibly extending back through the early stage of glaciation to preglacial times. The oldest strata may be Early Cretaceous. Overlying carbonaceous sediments record a time of more temperate climatic conditions when vegetation existed on Antarctica. These are in turn overlain by sands representing an alluvial plain environment that may reflect the transition into the progressively colder climates that are recorded in the proglacial, glacial-marine, and sub-glacial sediments of late Eocene to early Oligocene and younger times. The ages constraining the transition to full-scale Antarctic glacial conditions are yet to be determined from palynological samples. The third site, 1167, was located in the middle of the Prydz Channel Trough Mouth Fan. Construction of the fan started in the early to middle Pliocene when the Lambert Glacier formed a fast-flowing ice stream on the western side of Prydz Bay. The fan has grown most during episodes when the Lambert Glacier has grounded at the shelf edge, delivering basal debris to the fan apex. The site documents previously unknown large-scale (20 m to more than 200 m thick) cycles in magnetic susceptibility and other properties that are not yet fully explained, but are likely due to systematic changes in the Lambert Glacier ice-drainage basin during Pleistocene and late Pliocene time. Many separate debris flows occur within the large cycles. Contacts between flows, hemipelagic muds and sands may indicate times of retreat of the ice-front from the continental shelf edge.

The Deep Biosphere

Studies of the deep biosphere were initiated on Leg 185, in the Mariana region, which established a microbiology laboratory, carried out microbial contaminant tests, and established techniques for core handling of biological samples. Contaminant tests using perfluorocarbon and fluorescent microsphere tracers demonstrated that sediments cored with the APC showed less susceptibility to contamination than RCB coring. These tests, which demonstrate that biological contamination can be assessed and surmounted, pave the way for establishing ODP as a new platform for microbiological studies. Microbioloigical studies were continued on Legs 186, 187, and 188. Samples have been taken to start culturing experiments in various media at both atmospheric and *in situ* pressure, and to begin shorebased DNA extraction and community characterization. Several glass samples from crustal sites show textural evidence for microbial alteration and invite the intriguing question of whether there is still microbiological activity in volcanic basement as old as 170 Ma.

Other Highlights

Active Heave Compensator

Many difficulties in downhole drilling and coring emanate from the ship's heave and its effect on the vertical motion of the drill string. While there are many external elements that the driller must contend with that affect the position of the drill bit, the overriding one is ship's heave. Drilling Services Department (DSD) recognized that the existing passive (air-operated) heave compensator was too slow to respond effectively to the heave cycles associated with higher operational sea states. DSD implemented the design of an active (hydraulic) heave compensator (AHC) that would complement the passive system and be more responsive to the ship's motion. The combined passive and active systems have a control system that enables the heave compensator to move as rapidly as the ship heaves. Thus, the active compensation system should improve the passive compensator performance which ranges from 50% in the low sea states to 80% in high sea states to 90% or more in all sea states.

The AHC system was installed during the Singapore dry dock in August and September 1999. Field modifications and start-up were carried out at the Fremantle port calls for Legs 187, 188, and 189. Initial field reports by the Drilling Engineering Team (DET) project engineer on Leg 187 indicated that software supplied by the AHC vendor had problems and needed to be resolved before the AHC system could be considered operational. The AHC was operated on a limited basis during this leg to obtain real time data for calibration. The DET project engineer continued trouble shooting the AHC system, but was hampered by not having the specialized Maritime Hydraulics diagnostic equipment and software for his use onboard. The AHC System was shutdown approximately one month into Leg 187 due to a hydraulic leak in the return hose. Prior to the start of Leg 188, an AHC servo valve failed during testing and calibration in Fremantle. The AHC was in a bypass mode for Leg 188 and did not interfere with the passive (air operated) drill string compensator. The servo valve was replaced at the Leg 189 port call. Maritime Hydraulics and DET project engineers performed testing, calibration, and crew training during the first part of Legs 189. The AHC will require continued "fine tuning" under a range of operational conditions, but it is operating on Leg 189.

Hard Rock Reentry System (HRRS)

Testing of two under-reamer style bits was completed in a quarry in Perth, Australia during March and August of 1999. These bits include a dual cam type bit as well as a three level pilot type bit. Both bits drilled for a minimum of five hours in various rock types. Two ring-style bits were developed and tested in January and February 2000. These bits were a 12.25-in friction-drive ring bit and a 11.75-in spline-drive ring bit. The ring bit design is a full circular ring attached to the casing, which engages with a center pilot-bit to cut the center section. The center pilot-bit is retracted with the hammer once the casing is drilled to depth. All of the above bits are more robust than those tested on Leg 179 and are designed to reduce or limit the stick-slip nature that caused the majority of the problems during the first sea trials.

The vendor has improved the piston control valve to eliminate the source of cracking that was seen during testing on Leg 179. Subsequent land tests have not shown a recurrence of the cracking problem. Unsupported spudding of the drill string on bare rock and with rough sea conditions may have exacerbated the hammer body flexing and bending motions that caused the piston to seize and the coating to spall. Increasing hammer body thickness to prevent the flexing should eliminate the problem if unsupported spudding is attempted again. The upper connection of the hammer to the bottom hole assembly has been changed to a connection with a better bending strength.

A vibration study was performed which revealed several areas in the standpipe that were susceptible to resonance vibration produced by the fluid hammer. These vibrations were seen when the hammer was first operated during Leg 179. Additional standpipe bracing was installed in the derrick during dry dock. A downhole pulsation dampener sub was also developed which will use a nitrogen-charged piston to absorb the pulsations. This pulsation dampener will be placed immediately above the hammer downhole to eliminate the pulsation as close to the source as possible.

An alternate tornado-sub concept with a different operational principle was built and will be used in the bottom hole assembly to assist in reducing the pulsation. The effectiveness of either sub will not be known until the next sea trials are performed with the hammer on Leg 191 (July/Sept. 2000).

Rig Instrumentation System

A new Rig Instrumentation System (RIS) provides for real-time monitoring and electronic storage of drilling parameters and vessel motion. Surface drilling parameters can be compared to real time data from the bit to diagnose performance. The RIS completes the initial requirement for digital operational data collection at the surface.

Ryan Energy Technologies supplied the RIS Fusion system which was installed on the drillship during the Singapore dry dock in September and October 1999. Sea trials were conducted in November 1999. The RIS Fusion system is a PC-based data acquisition system with the master computer serving the Driller's Console and broadcasting the data to remote workstations in the ODP Operation Manager and ODL Drilling Superintendent's office. The RIS Fusion system provides algorithms for tracking depth and calculating WOB and ROP. The system software displays the data in multiple windows, including historical log plots. Calibration of the instruments and training of the DSD and ODL crews were conducted on Legs 187 and 188. The system is now fully operational on Leg 189.

The RIS Fusion system will be improved by the installation of instrumented load pins at the top of the hook during Legs 189 and 190 port calls. These instrumented load pins will

provide a more accurate and stable measurement of drill string weight than currently available from the hydraulic load cell mounted in the crown.

The RIS Fusion system successfully collected MWD/LWD data on Leg 188. The MWD real time data (weight-on-bit, torque-on-bit) was transmitted to the Fusion Rig Instrumentation System via an RS422 link from the MWD/LWD data acquisition system. This was the first time that real time downhole data was displayed along with surface data to the driller and other remote workstations.

Dry Dock

The *JOIDES Resolution* arrived at the Keppel Shipyard, Singapore, on 1 September 1999 following a transit from Yokohama, and departed 28 October for sea trials and transit to Fremantle for the beginning of Leg 187. The length of the shipyard period was 58 days, approximately 20 days longer than originally scheduled. The increased time in the shipyard was a consequence of a number of complimentary and additive factors: some tasks turned out to be more complex and time consumptive than originally forecast (AHC installation, replacement of steel in hull and thruster modifications, and replacement of sanitary piping throughout quarters); and two new tasks were added during the yard period (a partition in the forward drill water tank and a dead weight survey). The goal of the dry dock was to maintain and improve the safe and efficient working environment of the *JR* and upgrade the ship's operational capabilities to better achieve the objectives set out in ODP's Long Range Science Plan. This goal was attained.

The activities that took place during the Singapore shipyard can be grouped into three categories. The first, and by far the most extensive, were the repairs and upgrades of the ship and its equipment. These activities were necessary for the five year contract extension through FY2003. NSF contributed 6 million dollars to this endeavor and Offshore Drilling Limited (ODL), the ship's operator, contributed 1.3 million dollars in addition. The second group of activities were the repairs and upgrades to the scientific infrastructure on board the ship and these projects were supported by the co-mingled funds of the Ocean Drilling Program. The two major projects in this category were the addition of the new 7th level and the modification of the core handling and description area on the 6th level. The third group of activities were three major projects that were scheduled during the Singapore yard period because they represented complex and demanding installations that could be best accommodated during an extended period of time when the ship was out of service. Two of these projects, the Active Heave Compensation (AHC) system and Rig Instrumentation, were carried out by ODP and the goal of these two projects was to enhance our ability to make hole and recover better sections of core through the utilization of new drilling technologies. The third project, the installation of a synchronous generator, was carried out by ODL and it is anticipated that this system will save significant fuel because the ship will operate more efficiently.

A summary of the projects carried out in drydock are as follows:

ODL Projects: Maintenance, Safety and Upgrades

- refurbishment to the ship's hull, thrusters, thruster wells, tanks, propulsion gear box, rudder;
- renewal of the salt water/bilge system;
- replacement of all sanitary piping within the accommodations;
- replacement of the crane booms;

- drilling equipment was stripped down and inspected;
- a new data management system (DMS) was installed to regulate power on the ship more effectively and efficiently;
- a new automatic station keeping (ASK) system was installed that provides a dual redundancy for maintaining station under a greater range of environmental conditions; and
- a new breathing system was installed in the core lab, the core handling catwalk and the drill floor to facilitate safe handling of H2S laden cores.

ODP Projects: Maintenance, Safety and Upgrades

- the addition of a new floor on the lab stack allowing for the permanent installation of a microbiology laboratory, a renovated downhole telemetry laboratory, a new downhole measurements laboratory (DHML), a new conference room for the scientific party, and a loading platform for scientific equipment;
- the main core laboratory was renovated to improve core flow and analyses;
- labstack foundation reinforcement;
- fantail winch and boom refurbishment;
- sonar dome maintenance; and
- doppler sonar installation.

Additional Projects Carried Out During the Dry Dock Period

- ODL installed synchronous condenser to reduce maintenance of equipment and increase fuel savings;
- ODP enhanced the heave compensation on the ship by installing an AHC system to de-couple ship's heave from the drill string and by installing low friction seals in the passive compensator to improve responsiveness; and
- ODP installed the Rig Instrumentation System to more effectively display and record salient drilling parameters.

The Singapore shipyard period represented the largest project taken on by the Program since the ship was converted for ODP 16 years ago. Most of the projects were completed and commissioned before the ship arrived in Fremantle to begin Leg 187, but it has taken a few legs to bring closure to some of the projects and to "shake-down" some of the new systems. The "shake-down" period was more challenging because Legs 187 and Leg 188 took us to the remote Southern Ocean where environmental conditions and logistic isolation made it difficult to respond to problems. Nevertheless, at this time all systems are up and running and only two tasks are outstanding:

- the ASK system has not been accepted for shallow water conditions (<50m) and ODL is awaiting new shallow water beacons from the manufacturer before a shallow water test can be carried out; and
- the AHC system needs to be fine-tuned for a range of sea states before it will function in a most optimal fashion and this will take time. Moreover, one of the ODL drilling crews has not yet been trained with the AHC and this is scheduled to take place during the first few weeks of Leg 190.

Overall, the *JOIDES Resolution* is a much more capable vessel with extended water depth capabilities, improved operational efficiency, and the capability to routinely conduct microbiology and gas hydrate research.

Core Lab Modification

During the dry dock period which extended from FY99 into FY00, significant modifications were made to the core lab on *JOIDES Resolution*. Most significant of these are the addition of a new level to the top of the lab stack and a reorganization of the core lab. The new level on the lab stack provides substantial additional space for instrument servicing and preparation, a new conference room, and additional lab space that allows microbiology to become a permanent addition to the lab stack. The basic exterior "shell" was installed during dry dock; internal outfitting of the space extended through Leg 189 (well into FY00) since time was not available during the yard period to complete this task The fundamental change in the core lab consisted of relocating the core splitting room from the center of the lab to the port after corner. This will improve core flow, easing the workload of the technical support staff, and facilitate core lab ventilation.

Advanced Diamond Core Barrel (ADCB)

The ADCB was successfully land tested near Dayton, Nevada in May 1999. More than 150 ft of coring penetration was recorded with core recovery of 96%. The ADCB core barrel is designed to operate without a liner (3.345-in core) or with steel split liners (3.27-in core). Land tests were performed without liners with the core barrel configured in a 15-ft length. An additional land test is scheduled for May 2000 for the complete ADCB system, including the new shock sub, circulation sub, and positive indicator latch. Offshore testing scheduled for Leg 186E was postponed due to dry dock delays. Leg 193 may provide additional sea trial opportunities for the complete ADCB system.

Two different latch styles were tested with the core barrel during May 1999. The conventional scissor-style latch and the new positive indicator latch. The new positive indicator latch style provides a pressure spike to indicate that it is properly latched into the core barrel. The new latch has an adjustment spring that can be preset to vary the amount of the pressure spike seen by the driller.

The ADCB system has a new shock sub that was designed and built to run above the ADCB core barrel to remove the transfer of vertical heave motion (shock) from the drill string to the core bit. The new tool is a fully pressure-balanced, shock sub that uses both pump-open force and applied WOB to reduce vertical motion propagated to the bit from surface induced drill string heave and bit-generated hammer effects.

The ADCB system has a new laboratory-tested circulation sub that will assist in preventing the BHA from becoming stuck should instability in the upper-hole causing cuttings to fall back into the hole. The circulation sub houses an adjustable, spring-loaded sleeve that can be opened by increasing pump pressure through the drill pipe without pulling the core barrel. Once the sleeve shifts, six ports are exposed which allow an increase in both rate and volume of drilling fluid to clean the larger upper hole section. Once the hole is cleared of the debris, the driller can return the flow rate to the normal operating pressure and continue coring or retrieve the inner barrel.

The ADCB system completed a retractable bit-testing program. Initial crown profile tests were completed in September 1999. Two scaled down versions of the winged bits were tested with two different coring diameters. Each core bit version had three fixed cutter sections that proved the retractable bit design could cut core with a potential bit life for at least 60 m. Additional funding and testing will be required to select the correct bit matrix

material, diamond concentration, and diamond size to core a specific rock type when additional retractable bit technology is pursued.

Deep Biosphere Technology

Tracer testing was conducted on Leg 185 to evaluate the level of contamination to core samples during the coring process. Two tracer methods were evaluated. These included fluorescent micro-spheres (FMS) and perfluoromethylcyclohexane (PFC) solution. Small plastic bags (Whirl-Paks) with FMS were placed inside the core barrel above the core catchers. Previous testing during Leg 183 had shown that this deployment method would survive when the core barrel is dropped inside the drill string. As the core is cut, the core breaks the bags and the FMS are released inside the core barrel. The PFC solution was injected at a concentration of 1 ppm downstream of the centrifugal charge pump and into the No. 2 (portside) triplex mud pump intake. Injection timing was coordinated with the driller to allow the scientists to start, stop, and change injection rates. Deep biosphere studies are scheduled to continue into FY01.

Leg Achievements

Leg 186 was devoted to permanent installation of seismometers and strain meters in two holes off Japan. The instrument packages were developed through a joint U.S.-Japanese program. Installation required the successful deployment of the longest casing string yet suspended from a deep sea drillship. At each site cementing the instrument packages in place 1 km below the sea floor was followed by a major "all hands" effort to deploy cables necessary to deliver data from the instruments to sea floor recording modules. The endeavor was capped by the successful deployment and cable connection of the recording modules.

Following dry dock, Leg 187 successfully used a "reactive" drilling strategy to demonstrate that the boundary between Indian Ocean and Pacific mantle-types, in the region of the Australia-Antarctic Discordance, has been relatively stable for the past million years, rather than having migrated steadily westward as formerly suspected. The success of Leg 187 was critically dependent on the ability to quickly analyze recovered samples for trace element composition. This was achieved through use of ICP-MS (see below), which yielded chemical analysis data within hours of acquiring the core samples.

Repository Activities

The cores collected by ocean drilling are one of the enduring legacies of the Program. The four ODP repositories now house more than 276 km of core material which is available for study by scientists worldwide. During FY99, 12.7 km of new core material were received, with similar amounts projected for both FY00 and FY01. Providing samples from ODP cores for subsequent research projects is a function of the repository staff. In FY99 a total of more than 86,000 samples were taken. For FY00 and FY01 sampling activity is expected to rise to approximately 90,000 samples each year. At present about two thirds of the sampling activity (60,000 samples) occurs at the Gulf Coast Repository, which is the one currently receiving new core material.

World Wide Web

The amount of ODP data available on the web (www-odp.tamu.edu/database) is continuously increasing. At present the following data are available: (1) All ODP data from Legs 171 through 191, (2) ODP core and sample data from Legs 101 through 191, (3) DSDP core and sample data from Legs 1 through 96, (4) Paleontology range charts (Excel spreadsheets) from Legs 101 through 144, and (5) MST data from Legs 101 through 191. The data acquired in the last twelve months are available only to the participant scientists. The data not available on the web can be requested from the Data Librarian (database@odpemail.tamu.edu).

Data Migration

Several data migration projects are underway or completed.

First, ODP MST data have been migrated for Legs 159 through Leg 163 between 1 October 1999 and 31 January 2000. So far, MST data from ODP Legs 159 to Leg 170 have been migrated to the JANUS database. The Database Group/ISD expects to migrate all ODP MST data by the end of FY00.

Second, IS started migrating S1032 ODP data to the JANUS database in FY00. The first phase of the project, which was finished in December 1999, was to extract all those data from the S1032 database and save them as ASCII text files and/or Excel spreadsheets. The second phase began in January 2000 and is expected to end in May 2000. The project focuses on the verification of extracted data. The final phase includes the actual migration of the verified data to the JANUS database. Completion of this phase is expected before May 2001.

Third, color reflectance data migration was ongoing during FY00. ISD estimates completion of the migration of color reflectance data from Legs 159-170 by May 2000. Thus, while no color reflectance data exists for legs before Leg 159, data will be available for legs after Leg 159.

Publications

To date (February 2000), ODP/TAMU's publication list includes the following:

154 *Proceedings* volumes completed.

Four *Initial Reports* volumes in production.

Six *Scientific Results* volumes in production.

32 Technical Notes distributed and two in production.

93 Scientific Prospectus issues and 89 Preliminary Report issues in distribution.

Publication Services statistics:

- 98,984 pages have been published for the *Proceedings* volumes.
- Over 198,859 copies of the *Proceedings* volumes, 4,251 copies of the *Initial Reports of the Deep Sea Drilling Project* volumes, and 59,386 copies of the other ODP publications have been distributed to scientists and libraries in 24 member countries and 58 non-member countries.

- 2,339 scientists who participated in ODP cruises authored the *Initial Reports* volumes.
- The *Scientific Results* volumes 101–175 contain 2,680 papers authored by 6,193 scientists who were participants in ODP postcruise scientific research. Another 4,703 scientists participated in the peer-review process for these volumes.
- At least 173 papers based on postcruise research—authored by 428 scientists—have been submitted to journals and books for Legs 161–181.

Electronic technologies enable the Publication Services Department to prepare electronic products and features useful to the community. Web versions of publications broaden distribution of *Proceedings* volumes and other ODP publications to a worldwide audience. Publications produced in electronic formats provide authors with more flexibility in publishing large data sets, large numbers of plates and figures, color images, three-dimensional animation sequences, and video clips. Electronic products produced by the Publication Services Department include the following:

- 27 *Initial Reports* volumes (138, 151, 153, 156–160, 163–182) and 18 *Scientific Results* volumes (130, 138, 144, 146 [parts 1 and 2], 150X, 151, 154–164) have been published on CD-ROM.
- 21 *Initial Reports* volumes (150X, 166–180) and 13 *Scientific Results* volumes (150X, 152, 154–163) have been published on the Web.
- 30 Scientific Prospectus issues, 30 Preliminary Report issues, and nine Technical Notes are available on the Web.
- Leg-related citation lists for Legs 155 and beyond are on the Web. They list papers published in *Initial Reports and Scientific Results* volumes as well as in journals and books, and include links to abstracts and/or papers whenever permitted.
- Color core photo images from Legs 163–181 are accessible in the *Initial Reports* volumes on CD-ROM and the Web (and from JANUS Web). The "ODP Technical Video (Editions 1 and 2)," contains color digital images of the archive halves of cores from DSDP Legs 1–96 and ODP Legs 100–146, and is available on laser videodisc.
- The "Compiled Electronic Index of the *Proceedings of the Ocean Drilling Program*" (indexes from volumes 101–165) is available on CD-ROM and the Web. The "Cumulative Index of the *Initial Reports* of the Deep Sea Drilling Project" is available in print and CD-ROM format.
- The following resources are also available on the Web: Sample Distribution, Data Distribution, and Publications Policy, Publication Instructions for ODP Scientists, Citations from the *Proceedings of the Ocean Drilling Program* (a list of over 35,000 edited bibliographic citations from *Proceedings* volumes), Electronic Dictionary of Terminology Used in the Ocean Drilling Program, and Site maps of ODP Legs 101–186 and DSDP Legs 1-96.

Downhole Measurement Lab

The Downhole Measurement Lab (DHML) was successfully expanded and renovated during the FY 99/00 drydock. This work included both the computer user and tool workshop areas of the DHML. The walls, ceilings, and floors were entirely reconstructed to provide a more open environment and thus more efficient use of space. The computer network was rewired with Category 5 cabling and new data transmission cables were run between the Schlumberger logging units and the DHML. The Schlumberger logging unit was upgraded to an MCM (Minimum Configuration Maxis) class system. The MCM is a

PC based data acquisition system that is much easier to maintain and supports a wider variety of downhole tools.

Download Interface in the ODP Log Database

A new download interface in the ODP Log Database allows users to have greater control over the types of data they download from each hole. It also provides direct links from the log data to the corresponding core data from each hole in the Janus database. An article outlining the new features of the database appeared in the *JOIDES Journal*.

Logging-While-Drilling (LWD) and Measurement-While-Drilling (MWD)

During Leg 188, logging-while-drilling (LWD) and measurement-while-drilling (MWD) operations were carried out in Holes 1166B (Prydz Bay shelf) and 1167B (trough mouth fan). The aims of LWD/MWD were twofold: to record spectral gamma and resistivity logs with the CDR (Compensated Dual Resistivity) LWD tool; and to record downhole weight-on-bit (WOB) and other drilling parameters using MWD for the first time in ODP. There is significant information on the efficacy of the passive heave compensation system in the comparison between downhole WOB and the WOB measured at the surface, which is used by the drillers in the course of normal drilling operations.

LWD was also able to obtain good logs at Site 1167 where bad hole conditions severely restricted the wireline logging, and where core recovery was poor. The LWD logs were superior to the equivalent wireline logs in the 50m interval of overlap because bad hole conditions (washouts) had not had time to develop in the LWD hole. The resistivity logs reveal thin clay interbeds (probably interglacial) between thick diamict units (glacial). The GHMT was also successfully deployed during Leg 188 and recorded magnetic reversal stratigraphy in the shallow shelf environment.

COMPLEX

JOI, ODP's Prime Contractor, planned and coordinated the logistics of the JOIDES-sanctioned Conference on Multi-Platform EXploration (COMPLEX) at the University of British Columbia in Vancouver, Canada on May 25-29, 1999. COMPLEX, which focused on non-riser drilling needs, was designed to complement the CONCORD Conference held July 22-25, 1997 in Tokyo, Japan. The COMPLEX Organizing Committee, co-chaired by Nick Pisias (US) and Asahiko Taira (Japan), planned the content and objectives of this meeting. The conference featured 15 sessions on various scientific themes. Approximately 330 scientists participated in the conference representing over 21 counties. Overall the conference was deemed a great success. Many of the needs and priorities for a post-2003 drilling program were defined. The conference also gave the larger scientific community a forum to voice their expectations, needs and desires for a new program. A draft of the COMPLEX Report is available www.oceandrilling.org/COMPLEX/draft4-1.doc. The final report produced by this conference will be an essential foundation in designing a new scientific ocean drilling program based on the needs of the ocean sciences community.

Industry/Academia Workshop in Houston

On October 15-16, 1999, JOI hosted a workshop entitled "Cooperation in Scientific Ocean Drilling: Forging Industry-Academic Partnerships" in Houston, Texas. John Armentrout,

Mobil, chaired the workshop and Felix Gradstein, Saga Petroleum, served as the international facilitator. Nearly 50 scientists attended, with 19 participants from academia, 25 participants from industry, and 12 liaisons from various parts of ODP. This workshop opened communications between industry and academic organizations on collaborative efforts for a future program. The goals of the workshop also included identifying basic research issues shared by the academic ocean drilling community and industry scientists, and developing linked strategies to gather data (seismics and borehole), interpret data, assess geological process, and develop models. Results of this workshop are being considered in planning the next phase of scientific ocean drilling. Additionally, as a direct outcome of this workshop, approximately five drilling proposals involving the collaboration of industry and academic scientists were submitted to the JOIDES Office by March 31, 2000.

Ocean Drilling Seminar Series

As an important step in educating the public and policymakers about the importance and relevance of ODP's research, JOI established an Ocean Drilling Seminar Series that began in November 1999 and culminated in a special event at the Canadian Embassy on February 16, 2000. To celebrate 30 years of excellence in ocean research and exploration, the ODP sponsored a lecture series in Washington, DC. This series of four lectures, located on or near Capitol Hill, highlighted aspects of ODP's cutting-edge science and its relevance to societal needs. Concentrating each talk on a different ODP topic, the goal of the series was twofold: To make ODP's complex scientific research accessible to the general public; and to educate policymakers and potential IODP sponsors about ODP's scientific achievements and its importance to the future.

The series began with a lecture by Alan C. Mix, Oregon State University, on November 16. His talk, titled *A Tropical Trigger for Natural Climate Fluctuations? Evidence from Deep-Sea Sediments,* focused on how ODP science may be used to predict future climate change. *A New Bacterial World in Deep Ocean Sediments*, the next talk in the series, was presented a few weeks later on December 7 by John Hayes, Woods Hole Oceanographic Institutions. Hayes discussed ODP's research into the role and significance of recently discovered vast sub-seafloor bacteria populations. The third lecture, *Gas Hydrates – Linking Energy, Climate, and the Biosphere,* by W. Steven Holbrook, University of Wyoming, on January 10, 2000, explored the potential of methane hydrates as a possible future fuel source. The final talk, *The Future of Scientific Ocean Drilling: New Opportunities for Science and Industry*, was presented by Ted Moore, University of Michigan, and John M. Armentrout, Mobil Corporation on February 16 in association with a reception at the Canadian Embassy. Moore and Armentrout outlined plans for the IODP, a successor program to ODP, and possible future alliances with the petroleum industry.

FY 2001 Science Plan Summary (Legs 192-199)

The following is a brief summary of the scientific objectives of each leg scheduled for FY 2001 (See Table ES-1 and Figure ES-1).

The JOIDES Science Committee (SCICOM) considered 19 proposals for ranking and scheduling at its August 1999 meeting. Before ranking the proposals, SCICOM discussed them in terms of their relation to the scientific objectives and priorities of the Long Range Plan (LRP). SCICOM also forwarded two previously high-ranked proposals (431-Rev, West Pacific ION; 517-Full, Nankai II) directly to the Operations Committee (OPCOM) without re-ranking them to complete two multi-leg programs.

The LRP identifies fundamental scientific problems under two major research themes: Dynamics of the Earth's Environment and Dynamics of the Earth's Interior. The FY2001 drilling plan addresses these themes as follows:

Dynamics of the Earth's Environment:

Leg 194 (Marion Plateau) will study the effects of sea-level change on sedimentary systems. It will define the absolute magnitude of the major middle-Miocene sea-level fall and the magnitude of younger sea-level changes, and it will contribute to understanding the effects of sea-level change on carbonate sedimentary systems.
Leg 197 (Hawaii-Emperor Seamounts) focuses mainly on understanding the nature of hotspots, but it will also obtain information on the orientation of the Pacific plate during the early Cenozoic, an important aid in interpreting paleo-environmental data.
Leg 198 (Equatorial Pacific Paleogene Transect) will explore the peculiar conditions that existed in the Pacific Ocean during the early Cenozoic, when surface temperature gradients reached a minimum and when the equatorial sedimentation system behaved very differently from today.
Leg 199 (Hydrate Ridge) will investigate the physical properties of gas hydrates and associated sediments in a region where a large supply of methane exists in the shallow subsurface.

Dynamics of the Earth's Interior:

Leg 192 (Ontong-Java Plateau) addresses objectives within the sub-theme Exploring the Transfer of Heat and Materials from the Earth's Interior.
Leg 193 (Manus Basin) will investigate a unique oceanic hydrothermal system hosted in acidic volcanic rocks. This system relates more closely to many continental ore deposits than the basalt-hosted hydrothermal systems associated with mid-ocean ridges.
Leg 195 (W. Pacific ION) will fill a major geographic gap in the global seismic monitoring program.
Leg 196 (Nankai II) will use logging-while-drilling (LWD) and advanced CORKs to develop a more quantitative understanding of hydrogeologic, geochemical, and tectonic processes on a convergent margin.
Leg 197 (Hawaii-Emperor Seamounts) will explore an important aspect of mantle dynamics by testing the hypothesis that deep-seated mantle hotspots move with time and do not remain fixed.

Leg 192: Ontong-Java Plateau

A growing number of Earth scientists have recently recognized the importance of oceanic volcanic plateaus. Many of these large igneous provinces (LIPs) represent immense volumes of magma erupted on the seafloor in fairly short time periods. Emplacement rates of the largest LIPs may have approached the entire magma production rate of the global mid-ocean ridge system. In fact, the Alaska-sized Ontong-Java Plateau in the western Pacific may represent the largest igneous event of the last 200 my. The construction of LIPs and their effects on subduction patterns, continental growth, crustal evolution, ocean circulation, and global climate remain poorly understood, though clearly significant in some cases.

Leg 192 represents the first leg of a proposed two-leg program aimed at understanding the formation of the world's largest plateau. A transect of holes drilled into basement will determine the age, duration, and environment of eruption, the range and diversity of magmatism, the post-emplacement vertical tectonic history, the effects of rift-related tectonism, and the paleo-latitude of the Ontong Java Plateau at the time(s) of its emplacement.

Leg 193: Manus Basin

A major goal of the LRP involves understanding the interactions between seawater and hot crustal material in hydrothermal systems. Most hydrothermal activity in the ocean occurs along the mid-ocean ridge system and involves seawater-basalt interactions. Manus Basin provides a unique opportunity to study another class of hydrothermal system wherein the reactions occur between seawater and acidic volcanic rocks.

Leg 193 will drill four holes to investigate the magma-fluid interactions within a hydrothermal system hosted in felsic volcanic rocks. Research efforts will focus on 1) determining the composition of mineralized veins and alteration intervals below outflow zones, 2) comparing the conditions below shallow and deep inflow zones, and 3) modeling the entire hydrological system with the quantitative constraints derived from core samples and borehole wall structures.

Leg 194: Marion Plateau

Knowledge of how sea-level fluctuations control the nature and geometry of continental margin deposits remains qualitative, and improving that knowledge constitutes a major objective of the LRP. The Marion Plateau provides a unique opportunity to investigate the causes, magnitudes, and effects of sea-level change on continental margin sediments. Leg 194 will drill a series of holes on the Marion Plateau to compare the stratigraphic relationship between carbonate platform complexes that formed during second-order high stands in the early to middle Miocene and the late Miocene and thus determine the absolute magnitude of a major middle-Miocene (N12-N14) sea-level fall. This event caused a shift in the locus of carbonate platform deposition. The drilling sites lie along a single strike line on a single structural element. Thermal subsidence of the platform should have affected all sites equally, thus permitting an accurate measure of the amplitude of the sea-level fall. In addition, the Marion Plateau has an excellent overall record of Miocene sea-level change, including a complete third-order event stratigraphy between 4-30 Ma that will provide quantitative information for calibrating the global sea-level curve. Leg 194 will build on the achievements of earlier ODP drilling in the region (Leg 133) and on the results of previous sea-level legs in the Bahamas and on the New Jersey Margin.

Leg 195: Western Pacific ION

The western Pacific Ocean comprises the most suitable region for studying the dynamics of plate subduction, the formation and evolution of island arcs and marginal seas, and the relation of these processes to mantle convection. Japan maintains one of the densest networks of land-based seismic stations in the world, and good coverage extends throughout eastern Asia; however, the land-based network needs supplemental stations that can provide data from the mid-ocean floor and the plate subduction boundary. The ocean seismic network has developed through a strategy of outfitting ODP boreholes as long-term geophysical observatories. These observatories provide unique, previously unavailable seismic data that will help to quantify the dynamics of subducting plates from their entry into the mantle to their destruction in the deep mantle.

The proposal for the Western Pacific Geophysical Network called for two sites, as endorsed by the International Ocean Network (ION). The long-term ocean seismic observatory network was included as an initiative in the LRP as a contribution to the Global Seismic Network (GSN). The GSN has succeeded in resolving the earth's interior from land-based seismic stations, but still lacks coverage in large areas of the ocean. Two

western Pacific sites are designed to aid the study of earthquake dynamics, the dynamics of the subducting plates, the formation of island arcs, and the relation of these processes to mantle convection. The first site is scheduled for drilling during FY2000 and the second is scheduled here for drilling in FY2001. Long-term seismic observatories will be installed at both sites and connected to nearby telecommunications cables.

Leg 196: Nankai II

The Nankai Trough represents a classic example of an active convergent margin with a thick, but structurally simple, accretionary prism of clastic sediment, as shown in excellent high-resolution seismic profiles. Leg 196 comprises the second of a two-leg program designed to investigate hydrogeologic, diagenetic, and tectonic processes in the eastern Nankai Trough. It will devote time principally to logging-while-drilling (LWD) and installing advanced CORK hydrologic observatories at sites cored previously during Leg 131 or scheduled for coring during Leg 190. Detailed plans for Leg 196 may change in response to coring results from Leg 190. To allow sufficient time to make these adjustments, the Leg 196 pre-cruise meeting will occur as soon as possible after Leg 190. The LWD program will focus on determining the porosity, density, and velocity structure of the sediment column. State-of-the-art LWD tools will provide high-quality porosity and density logs to measure resistivity images and gamma radiation at the bit. As demonstrated by the results from Legs 156, 170, and 171A, the LWD logs should also prove useful for inferring *in situ* pore pressures. The advanced CORKs include new features for multi-level isolation and monitoring of the borehole, and for future deployment of instrument strings by wireline vehicle. These features will permit a more complete understanding of the fluid flow regime within the Nankai accretionary prism.

Following Leg 196, JAMSTEC will use a wireline reentry system to download pressure data from the advanced CORKs, install geochemical monitoring systems on the fluid sampling ports, and install geophysical instrument strings in the boreholes. Ultimately, links to fiber-optic cables on the seafloor may extend the lifetime of these experiments from several years to decades. Such long-term monitoring of multiple parameters at multiple sites will make it possible to study strain and changes in the hydrology and mechanical properties of the Nankai accretionary prism through a significant part of the subduction thrust earthquake cycle.

Leg 197: Hawaiian-Emperor Seamounts

The bend in the Hawaiian-Emperor Seamount chain reflects either a change in plate motion, assuming a fixed-hotspot frame of reference, or the motion of the Hawaiian hotspot relative to the Pacific Plate lithosphere. Evidence that supports the latter view includes 1) global plate motions predicted using relative plate motion data, 2) spreading-rate data from the North Pacific basin, 3) mantle flow modeling with geoid and seismic tomography constraints, and 4) new paleomagnetic data from the Emperor chain. The best available paleomagnetic data suggest that Pacific hotspots may have moved at rates comparable to those of lithospheric plates in late Cretaceous to early Tertiary times (81-43 Ma). If so, this requires a major change in how we view mantle dynamics and the history of plate motions. Leg 197 will drill five of the Emperor Seamounts to test the hypothesis of southward Hawaiian hotspot motion. The proposed drill sites lie at water depths of 1300-3000 m and have 40-1000 m of sediment (mostly silty clay, volcanic ash, claystone) overlying basaltic basement rocks. The principal objective is to penetrate the basement to moderate depths (150-250 m) and obtain samples suitable for determining radiometric ages, paleomagnetics, and paleolatitudes. These data will form the basis for testing the fixed versus moving hotspot theories and will provide insight on the history of the time-averaged geomagnetic

field and its paleointensity. They will also place fundamental constraints on the late Cretaceous to early Tertiary motion of the Pacific plate. An improved picture of the plate motion history will aid in interpreting proxy climatic data from previous and future drill sites in terms of past latitudinal gradients.

Leg 198: Equatorial Pacific Paleogene Transect

The complex equatorial current system represents one of the most persistent and clear traces of wind-driven ocean circulation. In the modern ocean, unequal hemispheric thermal gradients have pushed the Inter-tropical Convergence Zone (ITCZ) north of the equator and given rise to a narrow band of equatorial upwelling. This zone of upwelling and high productivity results in a high flux of biogenic debris within 1.5–2° latitude of the geographic equator, with peak values restricted to an even narrower zone. Over geologic time, the rain of this debris in the Pacific Ocean has built a mound of almost pure calcareous and siliceous sediments stretching along the equatorial region and reaching a thickness of >500 m. Plate motions have carried this mound of biogenic sediment steadily northward, such that its thickest part lies several degrees north of the equator. Moreover, sediments deposited a few tens of millions of years ago have moved completely out of the region of high sediment flux. This movement into regions of very low sediment accumulation (or even erosion) puts Paleogene equatorial sediments within reach of APC/XCB drilling technology. Most of these sediments have never experienced strong burial diagenesis, and time intervals notorious for extensive chert formation (e.g., the middle Eocene) are thus more likely to contain only easily cored oozes.

Leg 198 will use APC/XCB technology to drill a series of holes into Paleogene sediments in the eastern Pacific Ocean, centered on the approximate positions of the equator at 35-40 Ma and at 50-60 Ma. This study will focus on the oceanographic consequences of the long-term cooling since the beginning of the Eocene. It will also address 1) the long-term history of the intensity of atmospheric circulation, 2) the latitudinal movement of the ITCZ, and 3) the history of hydrothermal activity during the Eocene and how it might relate to warm climates or chert formation. Earlier results from DSDP rotary coring indicate that many of the planned boreholes should encounter a hiatus or a radiolarian-ooze/red-clay interval from the Holocene until about the middle Miocene. Lower Neogene and Paleogene calcareous oozes should occur below the carbonate-poor interval and permit detailed reconstructions of Eocene sea-surface temperature (SST) gradients and equatorial circulation and productivity. Northern sites in the proposed transect may contain only clays above the calcareous lower Eocene sediments. These sections are critical to mapping the movement of the ITCZ through time and to relating the extremely warm interval of the early Eocene to the history of hydrothermal activity. The southern sites are critical to mapping circulation changes during the rapid Eocene–Oligocene transition in calcareous sections.

Leg 199: Hydrate Ridge

Sedimentary gas hydrates have attracted considerable interest because of their potential for sealing hydrocarbon reservoirs, their significance as a possible resource, their role in slope stability, and their potential for causing climate change through catastrophic methane release to the atmosphere. Seismic data across Hydrate Ridge show systematic variations in the stratigraphic depth and reflectivity of Bottom Simulating Reflectors (BSRs) that may indicate the impact of tectonic activity on the evolution of the gas hydrate system on the Oregon margin. These patterns appear especially well defined on the southern part of Hydrate Ridge, where grab sampling in 1996 revealed the presence of massive gas hydrate deposits on the seafloor. Leg 199 will drill three holes, 400-700 m deep, with comprehensive biological and geochemical sampling and a suite of *in situ* measurements to

address the following specific objectives:

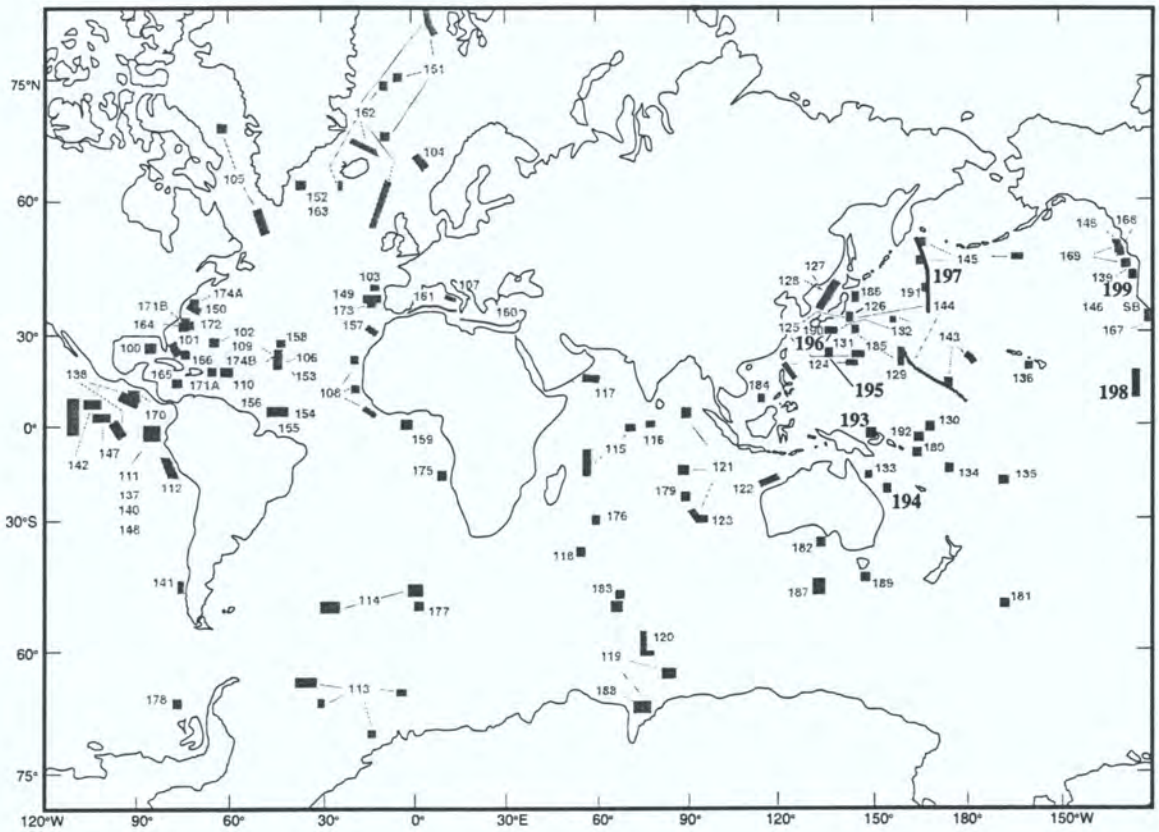
1) Compare the gas source region and the physical and chemical mechanisms of gas hydrate formation in two distinctly different sedimentary and tectonic environments. In the accretionary complex, the massive gas hydrates and associated authigenic carbonate that occur near the seafloor may originate from methane produced in older, underthrust sediments. In the younger, well-stratified sediments of the adjacent, rapidly filling slope basin, no significant gas hydrate or carbonate deposits occur near the seafloor, but seismic reflectivity indicates the presence of deeply buried gas hydrate or free gas, possibly of local origin.
2) Calibrate gas hydrate volumes and underlying free gas contents as estimated with geophysical remote sensing techniques. A better understanding of these properties is needed to map regional gas hydrate distributions and evaluate their future economic potential in subduction zone environments.
3) Use geochemical tracers, physical property measurements, and microstructural analyses to test whether variations in BSR and sub-BSR reflectivity observed in seismic data result from tectonically induced hydrate destabilization, as inferred from seismic reflection data.
4) Develop an understanding of the geochemical effects of hydrate formation to identify paleo-proxies for methane release that can be used to integrate the geologic data into climate models and understand the possible role of massive, catastrophic gas hydrate destabilization on global change.
5) Determine the porosity and shear strength of hydrated and underlying sediments to evaluate the relationship between gas hydrates, fluid flow, and slope stability.
6) Quantify the distribution of methanogenic and methanotropic bacteria in the sediments to evaluate their role in forming and consuming gas hydrate and in related sediment diagenesis.

Table ES-1: Ship Schedule for Legs 185 - 201 (FY 00 - FY 02)

	Leg	Port (Origin)†	Dates -
185	Izu-Mariana	Hong Kong	13 April – 15 June '99
186	W.Pacific Net	Yokohama	15 June – 15 August
	Transit/Drydock	Yokahama	15 August – 28 October
	Sea TrialsTransit	Singapore	28 October – 15 November
187	Australia-Antarctic	Fremantle	15 November - 12 January '00
188	Prydz Bay	Fremantle	12 January - 12 March
189	Southern Gateways	Hobart	12 March - 13 May
Transit (Townsville-Guam)		Townsville	13-24 May
190	Nankai I	Guam	24 May - 17 July
191	W. Pacific Ion/HD Engineering	Yokohama	17 July - 13 September
192	Ontong Java	Guam	13 September - 12 November
193	Manus Basin	Guam	12 November - 9 January '01
194	Marion Plateau	Townsville	9 January - 5 March
195	West Pacific Ion	Guam	5 March - 11 April
196	Nankai II *	Kaohsiung	11 April - 10 June
197	Hotspots	Yokohama	10 June - 10 August
198	Paleogene	Honolulu	10 August - 9 October
199	Gas Hydrates	Victoria	9 October - 6 December
200	H2O ¥	San Francisco	6 December - 13 January '02
201	SE Paleoceanography ¥	Panama City	13 January - 10 March‡

Notes:
- Port call dates have been included in the dates which are listed. For example, Leg 189 begins on 12 March with 4 days of scheduled port call.
The scheduled sailing date is 16 March.
† Although 5 day port calls are generally scheduled, the ship sails when ready.
* Mid-leg port calls may occur for Legs 196 and 199.
‡ Leg 201 is tentatively scheduled to end in Valparaiso.
¥ Legs 200 and 201 require EXCOM approval.

Figure ES-1: Drilling locations through Leg 199. FY 2001 locations are shown in bold.



Budget Overview

The Program Plan budget successfully meets the FY01 target of $46.1 M provided by the US National Science Foundation (Table ES-2). The budget is designed to meet the highest priority science and engineering needs identified by the JOIDES advisory structure. Once the needs are identified, the budgeting process begins by determining the leg-based scientific and operational requirements, including the costs of ship operation, drilling and down-hole operations, logging science, and laboratory needs, among others. Consistent with the Program-wide move towards project-based management, and identification of research legs as "projects", the majority (greater than 75%) of the science and logging operational budgets have been allocated to, and apportioned within, leg-based budgets. Detailed budgets, for Legs 192 through 199, are presented in the "Program Plan" section. Note that although Leg 199 is scheduled to sail in the next fiscal year (FY02), a portion of the science operator's costs for this leg will be incurred in FY01, and are thus budgeted therein.

The second step in the budgeting process, which is taken to maintain scientific innovation in the Program, is allocation of approximately $2.1M (~$800K more than in FY00) for science and engineering needs of the highest caliber. These are referred to as "special operating expenses" (SOEs). Nearly $1.17M has been budgeted to provide the capability for long term *in-situ* monitoring of geological processes in the Nankai Trough region, off Japan, during Leg 196. This scientific initiative, highlighted in the 1996 ODP Long Range Plan, will enable scientists to establish multiple, isolated zones within the drill hole for hydrogeological investigation, monitoring, and characterization of the processes that epitomize the dynamics of a convergent margin. About $870K will be used by the science operator for Advanced CORKS and affiliated hardware. The remaining $300K will be used for logging-while-drilling in Nankai's accretionary prism, where the challenging environment will likely preclude high recovery of cores and standard logging operations.

The science operator's budget also includes an additional $500K for other leg-based SOE expenses, such as for special drill bits, casing equipment, re-entry cones, and extra liners for high recovery legs. An engineering development project, described in the "Program Plan" section, and named "Downhole Measurements Technology", has been budgeted at $170K. This project will enable centralized support for tools that are used to determine formation temperature, and to sample water and gas hydrates *in situ*, among other things. A Service Center will be established to provide centralized documentation control, inventory control, technical support, and orderly implementation of upgrades and changes.

Logging SOEs include an additional $212K for specialty logging tools on three legs, and $50K for a joint pilot project with the Site Survey Data Bank (SSDB) that will enable ODP scientists to integrate and manipulate seismic survey data with log and core data on a computer workstation on the drillship and at the SSDB.

The third step in the budget process is assessing Program needs that are not directly affiliated with legs, such as services in science, technical support, operations, publications, information, management, administration, logging, JOIDES advisory, public affairs, and technical and engineering development projects. These funds, together with associated leg-based funds are incorporated into the department-based budgets presented in Table ES-2.

In FY01, the Program will see no increase in funding above the FY00 level. Standard increases in fixed costs (such as *JOIDES Resolution* leasing expenses) and in inflation, reduce the Program's base budget for scientific research. As explained in the FY98, 99, and 00 Program Plans, the ODP contractor and subcontractors have adapted to a flat, or

effectiveness. This year, in addition to these measures, the Program managers intend to deliver the highest priority JOIDES science by assuming additional risk, by not filling positions that were identified for new projects, and by cutting lower priority science that would be accomplished if funds were available.

Two examples of risk are highlighted. The FY01 plan budgets ship fuel at its historical average of $200/metric ton whereas current (May 2000) prices are approximately $300/ton. The assumption, and thus the inherent risk, is that fuel prices will return to historic averages. Second, normally scheduled refurbishment of drill pipe will not be conducted in FY01. This will result in degradation of the drill pipe and will increase the possibility of pipe loss during subsequent drilling operations.

In an attempt to offset flat funding, the Program has sought funds from external sources and will continue to do so. In FY00, over $500K of funds or equipment contributions-in-kind were provided by the US Department of Energy (for the purchase of an ICP-AES for the shipboard chemistry lab), by US scientists (in the form of lab equipment for the new microbiology lab, funded under the NSF "Life in Extreme Environments" initiative), and from JAMSTEC (to TAMU for the development of the Advanced Diamond Core Barrel). In FY01, the Program will realize ~$80K of cost savings through a new Schlumberger/GeoQuest university software license program. ODP has not seen a substantive increase in funding from existing or new partners in more than seven years. The increase in contributions by new partners has been more than offset by the decrease in contributions by others.

Table ES-2 summarizes the FY01 budget and compares it to the approved FY00 and 99 budgets. The ODP budget is divided into three major categories: Science Operations (TAMU), Logging Services (LDEO), and Prime Contractor (JOI/JOIDES) Services budget includes the LDEO Borehole Research Group, international processing centers, and the subcontractor (Schlumberger Offshore Services). The Prime Contractor (JOI/JOIDES) includes program management at JOI, advisory services of the JOIDES Office, the ODP Site Survey Data Bank at LDEO, and miscellaneous costs such as printing and distribution of the JOIDES Journal and providing Panel Chair Support.

Table ES-3 lists the Special Operating Expenses. Additional details are provided in the program plan section of this document and in the TAMU and LDEO appendices.

Table ES-2: Budgets for FY 99, FY 00, & FY 01 ($K)

TAMU	FY 99	FY 00	FY01
Science Services	4,218	4,388	4,373
Drilling Services	5,220	5,039	4,181
Information Services	2,222	2,411	2,473
Publications	1,665	1,756	1,776
Headquarters/Administration	2,061	1,854	1,960
Ship Operations	26,194 *	23,592	23,787
TOTAL TAMU	**41,580**	**39,040**	**38,550**
LDEO	**4,936**	**5,044**	**5,273**
JOI/JOIDES	**1,984**	**2,016**	**2,277**
GRAND TOTAL ODP BUDGET	**48,500***	**46,100**	**46,100**

* As in FY 98, NSF provided $3 M in FY 99 to cover obligations (totaling $6 M) associated with the drillship mid-life refit.

Table ES-3: Summary of FY 01 Special Operating Expenses

TAMU *	**$1,531,973**
LDEO **	**$562,692**
Total TAMU and LDEO SOE	**$2,094,665**

* TAMU's SOEs are incorporated into their leg-based and departmental budgets.
** For more details on LDEO's SOEs see page L-16 of the LDEO Program Plan, Appendix B.

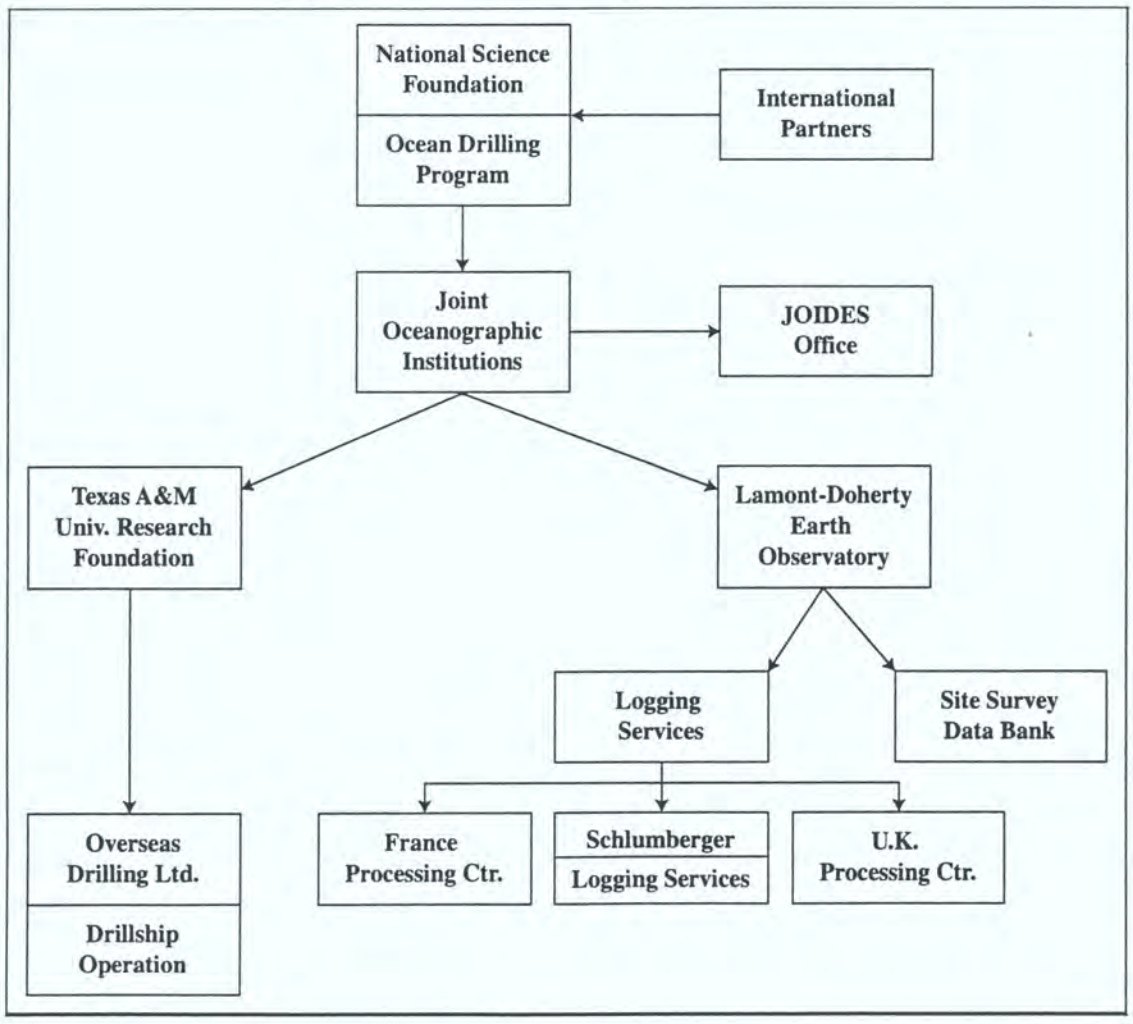
Ocean Drilling Program Organization

Organizational Framework

The Ocean Drilling Program (ODP) is funded by the US National Science Foundation (NSF) using commingled funds from the US and the international partners, that currently include the Australia-Canada-Chinese Taipei-Korea Consortium, the European Science Foundation Consortium for Ocean Drilling, Germany, Japan, the United Kingdom, the People's Republic of China and France. The ODP Council provides a forum for consultation between the NSF and the international funding agencies.

The organizational framework for ODP consists of four basic components: the overall Program Manager, Joint Oceanographic Institutions (JOI); the scientific advisory structure, Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES); the Science Operator Texas A&M University (TAMU); and the Logging Services Operator, Lamont-Doherty Earth Observatory (LDEO). The management relationships among these components are illustrated in Figure PP-1.

Figure PP-1: ODP Management Structure



In considering the organization of ODP, it is important to bear in mind that not only are the organizational components physically separated, but also that the program organization cuts across institutional lines. For example, LDEO houses parts of three different ODP organizational components (i.e., logging services, ODP Site Survey Data Bank and the TAMU-operated ODP East Coast Core Repository).

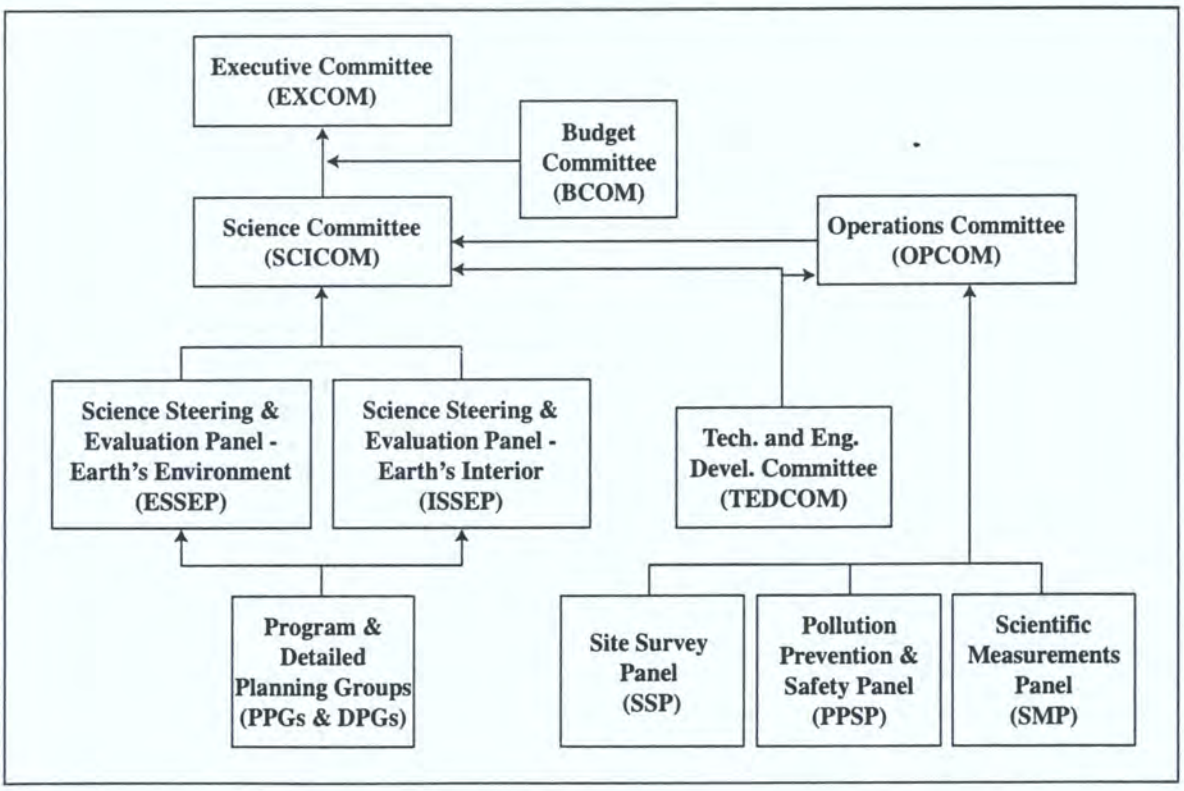
Program Manager

ODP is managed by JOI as the prime contractor to NSF. JOI is a consortium of fourteen major US oceanographic institutions (in legal terms, a not-for-profit corporation), which provides management support to large multi-institutional scientific research programs such as the ODP. JOI is located in Washington, D.C. and currently has a staff of 14, of which approximately 7.66 Full Time Equivalents (FTE) are directly charged to ODP, including one FTE offsite JOI employee who works as a liaison in the JOIDES Office. JOI provides scientific, contractual, management and fiscal links between NSF and the various operational and advisory components of ODP.

Scientific Advisory Structure

The scientific objectives of ODP are established by JOIDES panels, international groups of scientists drawn from the JOI institutions, other US institutions, and representatives of the non-US partners. JOIDES panels provide planning and program advice to JOI with regard to scientific goals and objectives, facilities, scientific personnel, and operating procedures. ODP national organizations appoint panel members, and over 200 scientists from the international geoscience community are represented on these panels (see Figure PP-2).

Figure PP-2: Science Advisory Structure



The JOIDES advisory structure and activities are coordinated by the SCICOM chair and the JOIDES Office. The JOIDES Office typically consists of four people (one of whom is the SCICOM Chair), and provides support for the JOIDES Executive and Science Committees and for the science advisory services structure. The office and the personnel rotate every two years between the U.S. and non-U.S. ODP members. Any U.S. institution, with the exception of the ODP subcontractors, Texas A&M University and Columbia University, is able to bid to host the JOIDES Office when the office rotates to the U.S. The JOIDES Office is currently located at GEOMAR in Kiel, Germany, and will rotate to the University of Miami in January 2001.

Science Operator

Texas A&M University (TAMU), located in College Station, Texas, serves as Science Operator for ODP through a contract between JOI and the Texas A&M Research Foundation (TAMRF). As Science Operator, TAMU is responsible for implementing science and operations, including managing the operation of the *JOIDES Resolution* (owned and operated by Overseas Drilling, Ltd. [ODL]); engineering development and improvement of drilling technology; selecting scientists for the shipboard scientific parties; designing, furnishing, staffing and maintaining shipboard laboratories; curation and distribution of all core samples and core-related data; publishing scientific results; and working with JOI to provide public information about ODP. TAMU has facilities that serve as a repository for ODP cores from the Pacific and Indian Oceans. In addition, TAMU is responsible for core repositories at LDEO for Atlantic, Mediterranean, and Caribbean cores through Leg 150; at Bremen, Germany for Atlantic, Mediterranean and Caribbean cores from Leg 151 onward; and at Scripps Institution of Oceanography, which houses previously-collected DSDP cores from the Pacific and Indian Oceans. The general organization of the Science Operator is shown in Figure PP-3 and is detailed in Appendix A (TAMU section) of this Program Plan. The TAMU staff currently consists of 146.12 FTE.

Logging Services

Lamont-Doherty Earth Observatory (LDEO), located in Palisades, New York, and affiliated with Columbia University, provides, through its Borehole Research Group, a full suite of geophysical and geochemical services which involve the acquisition, processing and presentation of *in situ* borehole logging measurements. LDEO is charged with providing state-of-the-art "oil industry" logging customized to the scientific needs of ODP, plus certain specialty logs. LDEO also provides interpretation and dissemination services to ODP scientists.

The organization of the ODP logging services operation is shown in Figure PP-4 and is detailed in Appendix B (LDEO section) of this Program Plan. A log analysis center operated by the Borehole Research Group at LDEO with additional processing centers in France, United Kingdom, Germany and Japan, has computer processing, log analysis and interpretation services for post-cruise use by ODP scientists. LDEO also contracts for basic oil-field type logging services from Schlumberger Offshore Services. The Logging Services staff currently consists of 16.84 FTE.

ODP Site Survey Data Bank

The ODP Site Survey Data Bank, formerly the IPOD Data Bank, is located at LDEO. It has served the JOIDES community since 1985 by cataloging, collecting, and distributing site survey and other geophysical data to various panels and individuals associated with scientific ocean drilling. The Data Bank staff currently consists of 3.25 FTE.

Figure PP-3: ODP Science Operator Organization

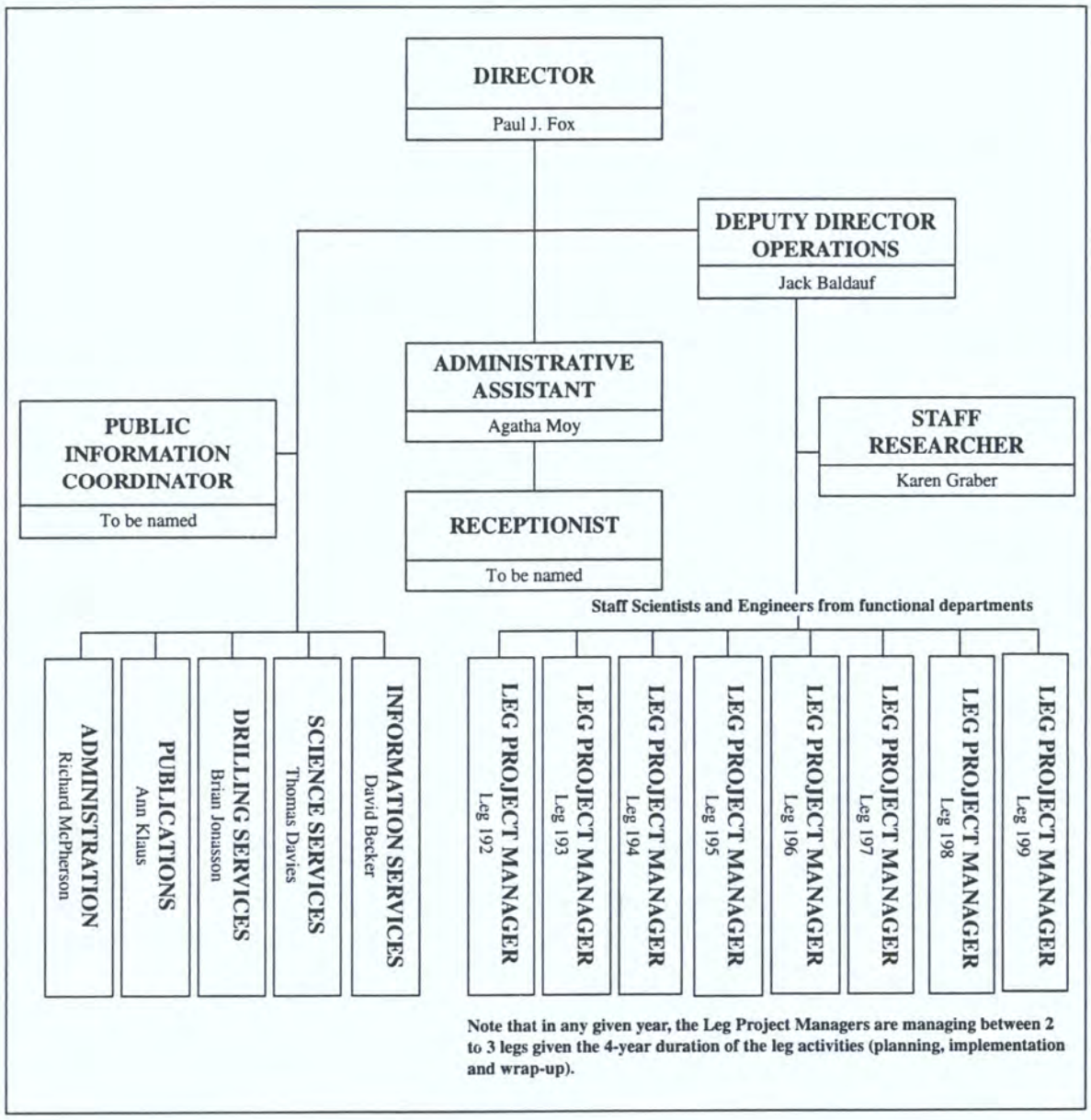
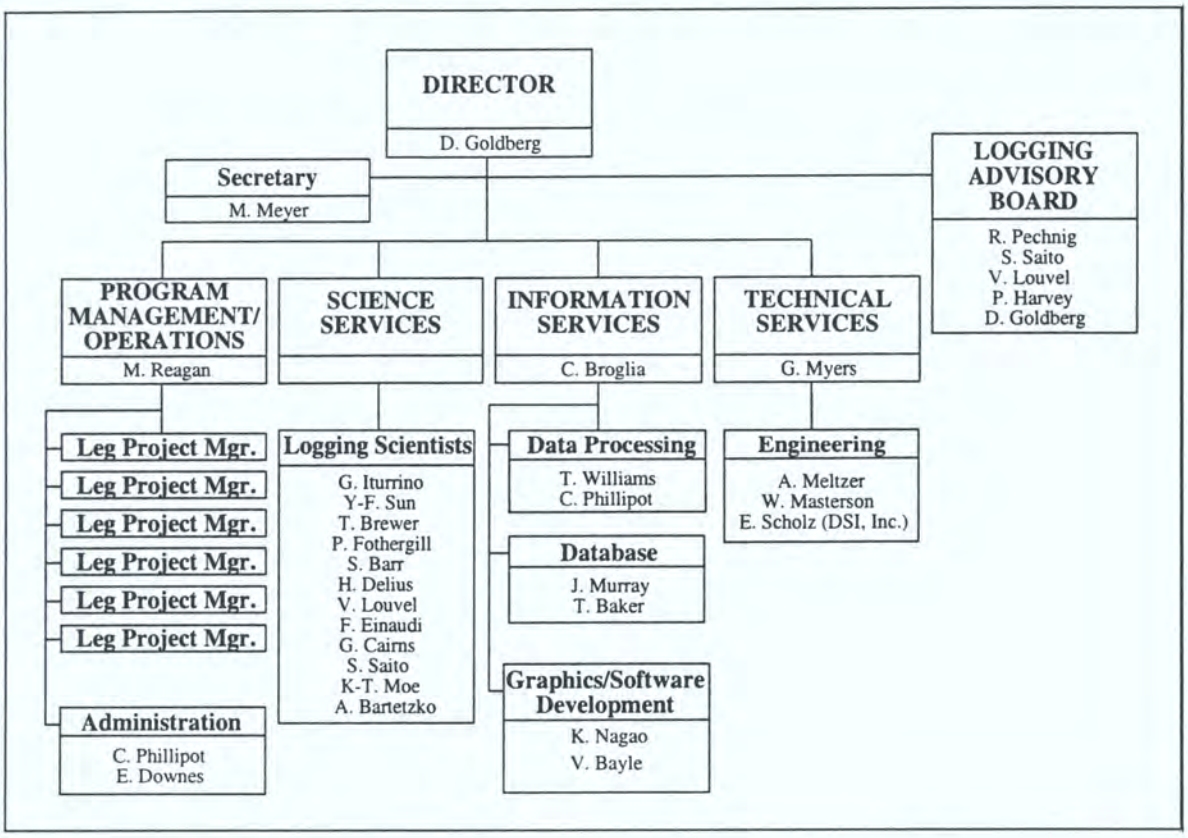


Figure PP-4: ODP Logging Services Organization



Program Summary

The operational phase of ODP began in January 1985 with the completion of the shakedown cruise (Leg 100) and acceptance of the *JOIDES Resolution.* As of May 2000, 89 operational cruises will have been completed (Legs 101-189) and Leg 190 will be underway. Table PP-1 summarizes the FY 00-02 schedule of the *JOIDES Resolution*; (Figure ES-1 shows the location of all ODP operations through Leg 199). Initial description of the cruises and scientific results can be found in the "Preliminary Reports" available on the World Wide Web (www-odp.tamu.edu/publications). For each leg, the Science Operator publishes detailed descriptions of the drilling results and scientific accomplishments in the "Initial Reports" (printed 10-12 months post-cruise) and the "Scientific Results" (printed 36 to 48 months post-cruise) volumes of the *Proceedings of the Ocean Drilling Program.*

The *JOIDES Resolution* has now drilled in the Atlantic, Pacific, Indian, and Southern Oceans, including high-latitude zones bordering East and West Antarctica and Greenland, and the Mediterranean, Caribbean, Weddell, Sulu, Celebes, Philippine, South China and Japan Seas, in search of answers to important scientific problems designated by JOIDES. As of Leg 187, she has revisited, drilled, and cored 1,471 holes at 558 sites and retrieved 178,518 meters of cored material, and has logged 305 holes. As of Leg 188, 2,191 shipboard scientists from around the world have participated in cruises. These scientists have taken over 1,500,000 individual samples to their home institutions for further study.

Table PP-1: Ship Schedule for Legs 185 - 201 (FY 00 - FY 02)

	Leg	Port (Origin)†	Dates -
185	Izu-Mariana	Hong Kong	13 April – 15 June '99
186	W.Pacific Net	Yokohama	15 June – 15 August
	Transit/Drydock	Yokahama	15 August – 28 October
	Sea Trials/Transit	Singapore	28 October – 15 November
187	Australia-Antarctic	Fremantle	15 November - 12 January '00
188	Prydz Bay	Fremantle	12 January - 12 March
189	Southern Gateways	Hobart	12 March - 13 May
Transit (Townsville-Guam)		Townsville	13-24 May
190	Nankai I	Guam	24 May - 17 July
191	W. Pacific Ion/HD Engineering	Yokohama	17 July - 13 September
192	Ontong Java	Guam	13 September - 12 November
193	Manus Basin	Guam	12 November - 9 January '01
194	Marion Plateau	Townsville	9 January - 5 March
195	West Pacific Ion	Guam	5 March - 11 April
196	Nankai II *	Kaohsiung	11 April - 10 June
197	Hotspots	Yokohama	10 June - 10 August
198	Paleogene	Honolulu	10 August - 9 October
199	Gas Hydrates	Victoria	9 October - 6 December
200	H2O ¥	San Francisco	6 December - 13 January '02
201	SE Paleoceanography ¥	Panama City	13 January - 10 March‡

Notes:

- Port call dates have been included in the dates which are listed. For example, Leg 189 begins on 12 March with 4 days of scheduled port call. The scheduled sailing date is 16 March.

† Although 5 day port calls are generally scheduled, the ship sails when ready.

* Mid-leg port calls may occur for Legs 196 and 199.

‡ Leg 201 is tentatively scheduled to end in Valparaiso.

¥ Legs 200 and 201 require EXCOM approval.

Scientific Accomplishments during FY 2000

This section provides a brief account of the scientific accomplishments of Legs 185-188, and identifies how each addresses some of the major themes and initiatives of the ODP Long Range Plan. Between 12 April 1999 and 12 March 2000, the *JOIDES Resolution* drilled first in the western Pacific, in the Mariana-Izu region, and then emplaced two geophysical observatories near the Japan Trench before going into drydock. After drydock, the *JOIDES Resolution* operated in the Southern Ocean, first on the Southeast Indian Ridge between Australia and Antarctica, and then in the region of Prydz Bay, Antarctica. It must be borne in mind that most of the major scientific results will become known only after completion of the shore-based studies and analyses currently under way.

Major Theme: Exploring the Transfer of Heat and Materials to and from the Earth's Interior

During FY 99-00, two ODP Legs, 185 and 187, were devoted to different aspects of this topic. The first of these legs explored the chemical fractionation of materials as they become subducted. The mass balance and temporal variability at subduction zones is one of four sub-themes recognized in the Long Range Plan. Convergent margins are an important part of the Earth's chemical differentiation system, and have recently been termed "Subduction Factories." As the oceanic lithosphere is carried down into Earth's interior the material is subjected to increasing temperatures and pressures. One consequence is that most of the volatiles are forced out, and diagenetic and metamorphic processes alter the mineralogy of the remaining materials.

The second of these legs was devoted to mantle dynamics. Leg 187 explored the nature of the boundary between mantle domains reflected in the geochemical discontinuity that exists in ocean crustal rocks between the Indian Ocean and Pacific Ocean sectors of the passage between Australia and Antarctica.

Leg 185: The Mariana-Izu Subduction Factory

Seafloor formed at ridge axes, altered by interaction with hydrothermal fluids and cold sea water and covered by a blanket of sediments, is fed into subduction zones at convergent margins. Here it is mixed with mantle, and transformed into volcanic, fluid and gas products on the over-riding plate. The term "Subduction Factory" has recently been coined to describe this recycling process. Direct observation is difficult, but various geochemical tracers allow us to infer the processes that take place in the factory. By mass balancing the tracers, and measuring chemical fractionation that occurs between them, we can begin to understand how the factory works and affects Earth's evolution. The Mariana-Izu-Bonin margin has a lot to offer in tracer recycling studies. The volcanics have been well studied; sediment subduction is virtually complete; the upper plate is oceanic and therefore largely transparent to magma assimilation; and there is a wide aperture of output products on the upper plate, from serpentine seamounts in the fore-arc to zero-age basalts in the back-arc. The missing component to the recycling equation, however, has been the sedimentary and basaltic input on the incoming Pacific plate. The aim of Leg 185 of the Ocean Drilling Program was to core two sites in Mesozoic crust in the western Pacific, and so determine inputs into the western Pacific subduction factory. In order to characterize these geochemical fluxes, detailed geochemical data are required on the cored samples. These data must be integrated with logging information to reconstruct the entire drilled section of crust, and with seismic data to extend the fluxes regionally.

In terms of the Subduction Factory, Leg 185 results bear directly on the problem of the forcing functions on factory output, and the volatile cycle through the factory. Forcing functions include convergence vectors, thickness of the upper plate, slab temperature, and sediment transport to depth. The Izu-Mariana margin is an excellent area to examine these functions because of the large geochemical signal along-strike in the volcanic arc. There are significant differences in Ba/Na observed in the basalts formed in the Izu-Bonin and the Marianas systems. Similarly Pb-isotope variations are strikingly different and probably controlled by the sediment input to the system. The volatile emissions (H_2O, CO_2, SO_2 and Cl) from arc volcanics derive from the basaltic portion of the downgoing plate and the subducted sediments, but this volatile input is virtually unknown for any convergent margin. Results from study of samples taken on Leg 185 will demonstrate how alteration zones and carbonate veins are organized in ancient fast-spreading crust, and so enable the first estimates for volatiles in the upper oceanic crust and sediments near a subduction zone. It will then be possible to compare these estimates directly to volcanic and fore-arc volatile outputs.

The oldest oceanic crust on Earth is subducting into the Izu-Mariana arc system, and, in addition to providing geochemical data to input into the subduction equation, the two sites studied provide important constraints on the nature and history of Mesozoic ocean crust. Site 801 is in the Pigafetta Basin, which is in the Jurassic Quiet Zone (JQZ) and dated as ~170 Ma. It is the oldest crust drilled by ODP or the Deep Sea Drilling Project (DSDP). The second site, Site 1149 in the Nadezhda Basin, is on the same flow line as Site 801 but is on magnetic Anomaly M11 and has an estimated age of ~135 Ma. Both sites originated at spreading centers in the Southern Hemisphere and then migrated northward, but at different times and durations. Thus, in addition to the "Subduction Factory experiment," Leg 185 scientists had an unparalleled opportunity to (1) assess the equatorial sedimentation history of the Pacific Ocean since Mesozoic time, (2) place limits on the ages of the oldest magnetic anomalies in the ocean basins, and (3) study the nature of the JQZ.

Since the leg took place, several important ideas have emerged:

Punctuated Alteration - A Characteristic of Fast-Spreading Crust?

In contrast to the decrease in oxidative alteration that occurs with depth at other sites in the oceans, the MORB basement at Site 801 is punctuated by discrete zones of alteration between intervals of minimally altered basalt. These discrete zones occur adjacent to ocherous, Fe-Si-rich, low temperature hydrothermal deposits, and near breccia deposits probably related to near-axis faults. Away from these alteration zones, fresh basaltic glass occurs abundantly, demonstrating the spatially heterogeneous nature of seafloor alteration. Hole 801C is the only site to sample a significant portion of Layer 2A in fast-spreading crust, and so this organization of alteration zones near hydrothermal deposits and faults may be a hallmark of fast spreading crust. In order to quantify the visual descriptions, ground-truth the logs, and determine the timing of alteration events, a common set of samples of Site 801C basement lithologies was taken for all geochemical investigators.

Contrasting Sediment Input to the Mariana and Izu Subduction Zones

Having cored for the first time through the entire sedimentary section subducting at the Izu-Bonin margin, Leg 185 enables comparison of the inputs to the Mariana and Izu arcs. In contrast to the East Mariana and Pigafetta Basin sediments subducting at the Marianas trench, the Nadezhda Basin sediments lack a mid-Cretaceous volcaniclastic section, and contain more siliceous and carbonate-rich biogenic material due to its longer passage beneath zones of high biological productivity. Shorebased geochemical studies of communal samples will demonstrate the extent to which these different sedimentary

histories can be traced to the volcanic output from the two arc systems. For example, does the sedimentary and basaltic input on the in-coming plate provide suitable Pb isotope mixing end-members for the Izu arc volcanics, or are other mantle and upper plate sources required? Does the extensive biogenic section in the lower half of Site 1149, which is highly depleted in alkali elements, contribute to the low alkali content of the Izu arc?

Mesozoic and Cenozoic Pelagic Sequences
The equatorial paleolatitude history of Site 1149 during the mid-Cretaceous, combined with a predictable subsidence history, is ideal for testing variations in the Cretaceous CCD. Site 1149 sediments also record a well-developed metalliferous sedimentary profile, which documents clearly the decreasing influence of hydrothermal plume precipitation with distance from the ridge. Very high sediment accumulation rates (~ 30 m/Ma) and the mineral composition of the youngest sediments suggest that Site 1149 was in the reach of the Asian dust plumes after the early Pleistocene. An extensive Miocene to Pleistocene ash record preserves a history of Izu-Bonin volcanism, and represents a cannibalistic flux to the subduction zone.

Mesozoic Pacific Basaltic Glass
Fresh basaltic glass recovered from both Sites 1149 and 801 provide pristine samples of the igneous liquid that forms Mesozoic Pacific crust. These are valuable samples that record mid-ocean ridge processes, mantle composition and mantle temperature at a time preceding the Cretaceous superplume event in the Pacific.

Rapid Polarity Alternations during the Jurassic Magnetic Quiet Zone
Hole 801C Jurassic basement records up to six geomagnetic reversals. Not only are there several reversals, but some sections preserve gradual changes in the magnetic field direction from one polarity interval to the other. Thus igneous basement at 801C was extruded at a time of rapid polarity alternations of the geomagnetic field. These data may provide an explanation for the Jurassic "Quiet" zone in a series of superposed flows with opposite polarity, essentially canceling out one another. The presence of fresh basaltic glass at depth in 801C will also provide suitable material for paleo-intensity studies, to test the hypothesis that the Jurassic Quiet Zone was a time of low geomagnetic field intensity.

The Deep Biosphere
Leg 185 was the first ODP leg to invest a significant effort in equipping a microbiology laboratory, carrying out microbial contaminant tests, and establishing techniques for core handling of biological samples. Contaminant tests using perfluorocarbon and fluorescent microsphere tracers demonstrated that sediments cored with the APC showed less susceptibility to contamination than RCB coring. In fact, several APC core interiors were entirely free of contaminants, and both APC and RCB core interiors were free of the microsphere tracers. These tests, which demonstrate that biological contamination can be assessed and surmounted, pave the way for establishing ODP as a new platform for microbiological studies. Leg 185 samples are being used to start culturing experiments in various media at both atmospheric and *in situ* pressure, and to begin shorebased DNA extraction and community characterization. Several glass samples from Site 801C show textural evidence for microbial alteration and invite the intriguing question of whether there is still microbiological activity in 170 Ma volcanic basement.

Leg 187: The Australian-Antarctic Discordance

The Australian-Antarctic Discordance (AAD) is an anomalously deep region centered on the Southeast Indian Ridge between Australia and Antarctica. Among its unique features is an unusually sharp boundary between the ocean-basin scale upper mantle isotopic domains

of the Pacific and Indian Oceans. Its anomalous depth reflects the presence of both unusually cold underlying mantle and thin crust. The trend of this depth anomaly forms a shallow west-pointing V-shape cutting across the major fracture zones that currently define the eastern AAD segments. This V-shape implies that the depth anomaly has migrated westward at a long-term rate of ~15 mm/yr, much slower than the recent migration rate of the isotopic boundary. The depth anomaly may, in fact, have existed well before continental rifting began ~100 m.y. The presence of restricted sedimentary basins on both continents suggests that precursors of the present AAD may have existed for as long as 300 m.y.

Despite a uniform spreading rate, the eastern boundary of the AAD coincides with an abrupt morphologic change from an axial ridge with smooth abyssal topography off-axis (characteristics usually associated with fast-spreading centers) to deep axial valleys with rough off-axis topography (characteristics usually associated with slow spreading). Other anomalous characteristics of the AAD include a pattern of relatively short axial segments separated by long transforms with alternating offset directions, extremely thin oceanic crust, high upper mantle seismic wave velocities, and an intermittent asymmetric spreading history. Multiple episodes of ridge propagation from both east and west toward the AAD suggest that the upper mantle is converging toward this region. Recent numerical model studies indicate that significant subaxial mantle flow converging on the AAD may be an inevitable consequence of gradients in upper mantle temperature around the AAD. Finally, the morphological contrasts across the eastern boundary of the AAD are paralleled by distinct contrasts in the nature and variability of axial lavas, reflecting fundamental differences in magma supply because of strong contrasts in the thermal regime of the spreading center.

Within the easternmost AAD, there is a distinct discontinuity in the Sr, Nd, and Pb isotopic signatures of axial lavas that marks the boundary between Indian Ocean and Pacific Ocean mid-ocean ridge basalt (MORB) mantle provinces. The boundary itself is remarkably sharp, although there is a gradation within the Pacific region toward Indian Ocean characteristics within 50-100 km of the boundary. At zero-age seafloor, the boundary is located within 20-30 km of the ~126°E transform—the western boundary of the easternmost AAD spreading segment. The boundary has migrated westward across this segment during the last 3-4 m.y.

Possible long-term relationships between the isotopic boundary and the morphologically defined AAD fall into two distinct classes: either the recent isotopic boundary migration is simply a localized (~100 km) perturbation of a geochemical feature that has been associated with the eastern boundary of the AAD since the basin opened, or the migration is a long-lived phenomenon that has only recently brought Pacific mantle beneath the AAD. In the first case, the boundary could be related either to the depth anomaly or to the eastern bounding transform, but not to both in the long term. In the second case, the isotopic boundary has only recently arrived beneath the AAD. Although the latter possibility may initially seem fortuitous, it has been suggested that Pacific mantle has migrated westward into the region since 40-50 Ma, when separation of the South Tasman Rise from Antarctica first allowed upper mantle flow from the Pacific to the Indian Ocean basin.

The mantle source for Indian Ocean MORB is distinct from that of the Pacific Ocean MORB in having distinctly lower $^{206}Pb/^{204}Pb$ and $^{208}Pb/^{204}Pb$ and higher $^{87}Sr/^{86}Sr$, as well as systematically lower $^{207}Pb/^{204}Pb$ and $^{143}Nd/^{144}Nd$. The sharpness of the Indian/Pacific boundary, as expressed in the seafloor lavas, suggests that Indian MORB mantle presently abuts Pacific MORB mantle beneath the AAD, with little or no intermingling. In contrast, along the Southwest Indian Ridge, there is a much more gradational transition from Indian- to Atlantic-type mantle.

The distinctive characteristics of Indian MORB mantle have been variously attributed to the widespread dispersal of material with distinctive isotopic characteristics throughout an

otherwise "typical" depleted upper mantle. It has been suggested that the distinctive material is derived from: 1) Indian Ocean hot spot sources, especially the large long-lived Kerguelen mantle plume, or 2) lower continental lithosphere derived from the breakup of Gondwanaland, or 3) convectively recycled, subducted, altered oceanic crust, or 4) the interaction of Gondwana continental lithosphere with the Kerguelen mantle plume before India rifted from Australia and Antarctica.

The Leg 187 drilling was able to define the configuration of the Indian/Pacific mantle isotopic boundary. In addition to its importance as a "local" phenomenon, an improved understanding of this boundary is important for a broader general understanding of the oceanic mantle. Investigating the origins of the AAD and the isotopic boundary should also increase understanding of variations in geochemistry, isotopic makeup, temperature, and other physical characteristics of the oceanic upper mantle in general. Improved knowledge of the distribution of these chemical and physical characteristics in space and time will lead to a better understanding of the dynamics of the oceanic mantle and of its interaction with the magmatic processes of the mid-ocean ridge system.

Leg 187 penetrated 4406 m of seafloor, cored 617 m of oceanic crust and recovered 137 m of basalt from 23 holes at 13 sites with an average water depth of 4970 m. The goal was to locate the Indian-Pacific mantle isotopic boundary on 14-28 Ma seafloor north of the AAD. The onboard analysis program using Ba-Zr systematics to define the boundary between Indian and Pacific MORB was highly successful. It enabled the shipboard scientific party to converge rapidly on a solution to the key problem and to focus with confidence on sites in the vicinity of the depth anomaly. Nevertheless, the Ba-Zr systematics are an imperfect discriminant, and it may be that later isotopic analysis may lead to definitive assignment of some sites that are currently transitional or questionable in character. It is also possible, though less likely, that some sites are currently misidentified and may be reassigned when the isotope data become available.

Despite the uncertainties involved, it is clear that the mantle boundary is closely associated with the depth anomaly. The alternative hypotheses, that the boundary is associated with the transform boundaries of the AAD, or that the boundary migrated rapidly leaving a V-shaped "wake", appear to have been effectively ruled out. Based on the Ba-Zr data, however, it is not possible to draw a simple line that separates an Indian province from a Pacific province. This is neither surprising nor unexpected for two reasons: 1) the present day sharpness of the boundary may be transient, 2) the recent migration of the boundary may be just one of a series of transient, ± 100 km rapid oscillations about a mean position.

The shipboard scientific party was able to recognize a line that marks the eastern limit of identified Indian-type sites — the -500 meter contour of the depth anomaly. This contour tracks southward to coincide with the physiographic terrain boundary that follows the mantle boundary from zero-age to approximately 5 Ma. West of this line is a zone in which both Indian and Pacific mantle sources occur in close proximity to one another. It is assumed that this mixed region coincides with the depth anomaly, but its western boundary is not constrained. The mantle boundary has temporarily migrated eastward, for periods of a few million years, at least twice. The final definition of the boundary will have to await onshore isotope analyses of basaltic glass sampled during this leg.

Leg 187 scientists also sampled variably altered basalt and basaltic glass to characterize the microbial diversity of the deep biosphere. Enrichment cultures have been prepared in the new microbiology laboratory onboard *JOIDES Resolution*, and samples have been collected for postcruise DNA analyses and high-pressure incubation studies.

Major Theme: Investigating Deformation of the Lithosphere and Earthquake Processes

Leg 186 prepared a site for emplacement of a downhole seismometer that will become part of the International Ocean Network. It will enable acquisition of data that can be used for refining the tomographic images of the Earth's interior. The addition of the oceanic sites will significantly increase the resolution of the seismic imagery.

Leg 186: Japan Trench Geophysical Observatory

The scientific importance of cooperation with the International Ocean Network (ION) program for establishing long-term geophysical stations in deep oceans has been recognized in the ODP Long Range Plan. Many important inferences concerning the dynamics of the Earth's deep interior have been based on seismic tomographic images, including the existence of super plumes, deep continental roots, stagnation of subducting plates within the mantle, and variations in the thickness of the thermal boundary layer at the base of the mantle. Detailed examination of processes at active plate boundaries have also yielded information on magma reservoirs and on the décollement structure of subducting plates.

A major step forward in understanding the processes driving Earth's dynamics is being made by installing permanent observatories in the ocean basins, which constitute 71% of Earth's surface. Obtaining observations from oceanic areas is significant not only for global coverage, but because most of the plate boundaries exist beneath the oceans, particularly those boundaries where oceanic lithosphere is being generated and recycled.

The western Pacific is one of the best areas for addressing problems related to subduction. In particular, the Japan Trench area has been the site of much effort toward monitoring seismic and geodetic motions on land for many years. Past marine geological and geophysical investigations on both sides of the Japan island arc make this the best studied subduction area. It can be characterized as having a fast subduction rate and being seismically active and well-coupled. We also have knowledge of the sedimentary and tectonic environment from previous drilling, which found the forearc area to be subsiding as a result of tectonic erosion with little accretionary prism development.

To monitor strain and seismic activity continuously, to ultimately understand how plate motion is accommodated across a subduction zone, and to contribute to the better imaging and understanding of the mantle, during Leg 186 two borehole geophysical observatories were installed ~1100 m below the seafloor on the deep-sea terrace of the Japan Trench. Sites 1150 and 1151 are located in areas with contrasting seismic characteristics. The northern site (1150) is in a seismically active zone where microearthquakes are frequent and M7 earthquakes recur. The southern site is within an aseismic zone where no earthquakes are observed. These features coexist within the seismogenic zone of the Japan Trench plate subduction zone, where the >100-Ma portion of the Pacific plate is subducting at a fast rate (~8 cm/yr) beneath northern Japan causing major earthquakes along the trench. The difference in dynamic nature of the subduction seismogenic zone along the Japan Trench remains unexplained because no geodetic and few seismic stations exist on the seafloor to provide data in the vicinity of the décollement. Leg 186 was the first time that state-of-the-art strain, tilt, and seismic sensors for long-term operation have been installed in seafloor boreholes. The borehole instruments were emplaced only 10 km above the gently dipping (< 5°E) plate boundary. The systems will start collecting data in September 1999 and will be serviced by a remotely operated vehicle (ROV) at least once a year to recover continuous high-sampling rate and wide dynamic-range data.

Recovering volcanic ash records in much greater detail than had been possible on earlier legs in the Japan trench area was one of the highlights of the drilling. There is a general increase in abundance of ash from ~9 Ma and a peak in the 4-0.5 Ma at both sites. Postcruise studies will examine the details of the ash record.

Inorganic geochemical analysis confirmed that a large decrease in chlorinity and salinity with depth exists in the Japan Trench region. This was first observed at DSDP Sites 438 and 439 but not at other sites of Legs 56 and 57. The character of the anomalies also varies between the two ODP Leg 186 sites. The magnitude of decrease is much larger than in other subduction environments, such as Nankai or Barbados.

Once sub-seafloor geophysical observatories like those on Leg 186 are established, ways and means to recover the data and to keep the station running become necessary. Such tasks are not easily undertaken even if a site needs servicing only once a year. A new fiber-optic cable owned by the University of Tokyo already exists and currently terminates near Site 1150. Once Site 1150 has been demonstrated to be functioning properly, connections will be made to supply power, send commands, and retrieve data in real time on land. A 50-km cable extension is planned to connect Site 1151 with the shore as well. These stations will make invaluable additions to the existing geophysical network over the western Pacific. The data will eventually become accessible worldwide through the Internet.

Major Themes: Understanding the Earth's Changing Climate, and Causes and Effects of Sea-level Change

Leg 188 addressed two major themes of the Long Range Plan, climate change and the cause of sea-level change, by investigating the initiation of the glaciation of East Antarctica by drilling in the region off Prydz Bay, Antarctica. Prydz Bay and its adjacent continental rise is a key area for understanding the history of Antarctic glaciation. It is the downstream end of the Amery Ice Shelf-Lambert Glacier ice drainage system, which drains about 22% of the East Antarctic ice sheet. The Lambert Glacier responds to fluctuations of the interior of the East Antarctic ice sheet that are then reflected in the sediments of Prydz Bay. Included in the drainage basin are the Gamburtsev Subglacial Highlands, which may have been the nucleus of the earliest Antarctic glaciation. The underlying structure of the Lambert Graben has focused drainage into Prydz Bay at least since the Mesozoic. Early glaciers would have delivered sediment into the bay and later ice expansion would have caused the glaciers to flow into the bay, making it an excellent place to detect the earliest Cenozoic glacial sediments delivered to the Antarctic shelf.

During some, but not all, Cenozoic glacial episodes, the Lambert Glacier advanced to various points on the shelf, prograding the shelf and building a large trough mouth fan that records these major advances since the late Miocene-middle Pliocene. Interglacial sediments are probably preserved on the slope foresets; thus, the Prydz Channel Fan contains a measure of the major sediment pulses caused by peaks in Antarctic ice volume over the last 4-5 m.y.

The continental rise adjacent to Prydz Bay exhibits large sediment drifts deposited under the influence of turbidity currents from the continental shelf and deep currents in the Southern Ocean. These drifts are a fine-grained distal equivalent to shelf and upper slope sediments and record fluctuations in the ratio of continent-derived terrigenous sediments to oceanic material and record the fluctuations of oceanic current activity. The amount of terrigenous material rises strongly with major ice expansions so that interbedding of terrigenous-rich and biogenic-rich horizons tend to reflect glacial-interglacial cycles. The longevity of these

drifts and the presence of seismic horizons that can be projected back to the continental slope and shelf mean that these drifts can provide a link between continental glaciation and changes in the ocean back through time to the Paleogene.

Site 1165 was situated on the continental rise offshore from Prydz Bay. It targeted mixed sediment-drift, channel-levee sediments of the central Wilkins Drift, an elongate sediment body formed by the interaction of sediment supplied from the shelf and westward flowing currents on the continental rise. The site is in 3537 m deep water and was selected to provide a record of sedimentation that extends back to the onset of contour current influenced deposition on the rise. The main objective was to obtain a proximal continental rise record of Antarctic glacial and interglacial periods, for comparison with sites around Antarctica and with Northern Hemisphere ice sheets.

Drilling at Site 1165 yielded a composite 1000-m thick sedimentary section, through Pleistocene to lower Miocene strata with only a few minor disconformities (<2 m.y.). The number of ice-rafted clasts decreases downhole and isolated lonestones become rare below 500 mbsf. This suggests a significant change in the sediment-delivery system, possibly caused by a retreat of the Lambert Glacier and more temperate climate conditions in the Prydz Bay area in early Miocene time.

Site 1165 provides paleontologic and sedimentologic evidence that large variations in biogenic material and clay-size terrigenous debris from Antarctica have occurred here since early Miocene time. The up-hole decrease in sedimentation rates, increase in sand-size and lonestone IRD, and increase in frequency of depositional cyclicity (as reflected by alternating biogenic-rich and terrigenous-rich beds), suggests depositional paleoenvironments with decreasing sediment supply, increasing floating ice, and more alternations in bottom-currents. Such conditions point to a change from temperate- to polar-landscape conditions in the Prydz Bay region, with increasing ice cover and greater variability in amounts of ice-sheet transport of sediment directly to the upper continental slope. Changes in clay mineralogy indicate show that erosion of sedimentary rocks in the shelf basins started in the middle Miocene. The largest changes in conditions, as reflected by shifts in sedimentation rates at Site 1165, occurred in early Miocene (~17-18 Ma), middle Miocene (14-15 Ma), and late Miocene (7-8 Ma) times.

Site 1166 was situated on the Prydz Bay continental shelf on the south-western flank of Four Ladies Bank, about 40 km southwest of ODP Site 742. The early development and growth of the Cenozoic Antarctic Ice Sheet is believed to have started in the early middle Eocene to early Oligocene, but, to date. drilling on the continent and the continental margin has not sampled a stratigraphic section that clearly spans and includes the transition period from pre-glacial to glacial conditions. Site 1166 was chosen to recover core from the Cenozoic sediments below the horizon reached at ODP Site 742. This was intended to provide an age for the arrival of glaciers in Prydz Bay, and a record of changes in paleoenvironments and biota with the onset of glaciation.

Site 1166 recovered a limited set of cores that record brief segments of the history of Antarctic paleoenvironments possibly extending back through the early stage of glaciation to preglacial times. Seismic-stratigraphic correlation with ODP Site 741, about 110 km away, suggests that the oldest unit at Site 1166 may be Early Cretaceous. The overlying carbonaceous strata record a time of more temperate climatic conditions when vegetation existed on Antarctica. These are in turn overlain by sands representing an alluvial plain environment that may reflect the transition into the progressively colder climates that are recorded in the proglacial, glacial-marine, and sub-glacial sediments of late Eocene to early Oligocene and younger times. Rocks that are age-equivalent to the older strata at Site 1166 were sampled at ODP Site 742, 30 km away, and have lithologies consistent with this

scenario. The ages constraining the transition to full-scale Antarctic glacial conditions are yet to be determined from palynological samples.

Site 1167 was located in the middle of the Prydz Channel Trough Mouth Fan. Construction of the fan started in the early to middle Pliocene when the Lambert Glacier formed a fast-flowing ice stream on the western side of Prydz Bay. The fan has grown most during episodes when the Lambert Glacier has grounded at the shelf edge, delivering basal debris to the fan apex. This material was then redistributed by sediment gravity flows and meltwater plumes. Models of trough mouth fan sedimentation suggest that thick siliciclastic units should correspond to peaks in Antarctic ice volume whereas periods of reduced ice volume should be represented by hemipelagic sediments. Thus the alternation of facies in a hole through the fan should reflect the number of times the East Antarctic Ice sheet has expanded to the shelf edge through the Pliocene-Pleistocene.

Site 1167 is the first drill site to directly sample the sedimentary fans that are common on the upper continental slope around Antarctica. The site documents previously unknown large-scale (20 m to more than 200 m thick) cycles in magnetic susceptibilty and other properties that are not yet fully explained, but are likely due to systematic changes in the Lambert Glacier ice-drainage basin during Pleistocene and late Pliocene(?) time. Many separate debris flows occur within the large cycles. Contacts between flows, hemipelagic muds and sands may indicate times of retreat of the ice-front from the continental shelf edge.

Table PP-2: Correspondence of FY 99-00 Legs to Scientific Themes, Special Initiatives and Pilot Projects of the 1996 Long Range Plan

DYNAMICS OF THE EARTH'S ENVIRONMENT	LEGS	DYNAMICS OF THE EARTH'S INTERIOR	LEGS
Understanding Earth's changing climate	**188**	Exploring the transfer of heat and materials to and from the Earth's interior	**185,187**
Causes and effects of sea-level changes	**188**	Investigating deformation of the lithosphere and earthquake processes	**186**
Sediments, fluids and bacteria as agents of change	**185,186, 187,188**		
Pilot Project: Earth's Deep Biosphere	**185,186, 187,188**	*Initiative II: In situ monitoring of geological processes*	**186**

Status of the FY 2000 Drilling Program (Legs 189-191)

At the time of preparation of this document, **Leg 189 (Southern Gateways)** is underway off the Tasmanian coast. Leg 189 aims to investigate the development of the Antarctic Circum-Polar Current (ACPC) by coring five sites near Tasmania. The sites span the time interval before, during and after the Tasmanian Seaway between Antarctica and Australia opened. The open "gateway" allowed the ACPC to be initiated, leading to thermal isolation, cooling and ice build-up on Antarctica, and probably the progressive global cooling of the Cenozoic Era.

The five proposed high-resolution paleoceanographic sites amount to 3365 m penetration, in water depths of 1460-3570 m. They will address Middle Eocene to Quaternary paleoceanographic and paleoclimatic changes related to: Eocene rifting between Antarctica and Australia (Tasmania being the last to separate), Middle Eocene onset of Circum-Antarctic surface water circulation (40 Ma and 70°S), mid-Oligocene breakthrough of deep water (30 Ma and 60°S), Neogene development of the ACPC including zonal variations (much more detailed information for this area compared to other Southern Ocean ODP legs), interaction of the ACPC with other currents, possible early Pliocene warming, the mid-Pleistocene transition, and cyclic movements of the polar front at astronomical periodicities. The drilling program will document the paleoceanographic and paleoclimatic changes associated with the Paleogene marine rifting history and Neogene drifting history of this key southern area.

The drilling program will allow documentation of latitudinal variations in chemistry and thermal history of water masses in high southern latitudes, and longitudinal differences caused by the shallow ridge between the Indian and Pacific Oceans through the Miocene.

Leg 190 (Nankai Trough) scheduled to start on 24 May 2000 in Guam will address high-priority ODP objectives related to deformation and fluid flow in accretionary prisms, including structural and hydrological evolution of the decollement and major thrust faults. Leg 190 will core at five top priority sites, which will then be revisited during **Leg 196** for Logging-While-Drilling (LWD) and installation of two Advanced CORKs. The two-leg program builds on a rich heritage of prior DSDP/ODP drilling and extensive geological and geophysical surveys in this area. In 1999 a high-resolution 3-D multi-channel seismic survey was conducted along the Eastern Nankai Trough (ENT) transect, largely to lay groundwork for the long-range high priority IODP seismogenic zone drilling. It also serves to place the sites originally proposed for Leg 190 in a more complete structural context. The data from the 1999 survey provide spectacular structural images from the toe of the prism through several structural domains up the prism. This prompted a reevaluation of Leg 190 sites to address the originally proposed objectives in the spirit of the ODP mandate to set the groundwork for IODP seismogenic zone drilling. As discussed and approved at the February 2000 OPCOM meeting, the current 5-site Leg 190 coring plan can be summarized as follows:

<u>ENT-01A</u> (reference site) and <u>ENT-03A</u> (protothrust site) – These are the top-priority sites originally proposed to study deformation, structural control, and fluid flow at the toe of the accretionary prism. With previously cored Site 808, these also represent the original top priorities for Leg 196 LWD/A-CORK sites.

<u>ENT-07A</u> (slope basin) and <u>ENT-06A</u> (out-of-sequence thrust site) – These are new sites approx. 5-6 km apart in the large thrust slice zone where the prism is 1.5 to 3 m.y. old and 2-3 km thick. Here, major out-of-sequence thrusts (OOST's) may penetrate all the way to

the decollement near the upper limit of the seismogenic zone. Drilling at these sites will represent a genuine ODP contribution toward IODP seismogenic zone objectives.

WNT-01A, originally an alternate site just seaward of the Leg 87 reference site, replaces the WNT-03B site for study of along-strike variability of structure and fluid flow processes in the prism. Coring at WNT-01A will be tailored to address the most important aspect of the comparative study originally proposed for WNT-03B: sampling above and below the decollement to determine the nature of clay mineralogy and its relation to structural and fluid flow processes.

ODP **Leg 191 (Western Pacific Seismic Network)** will address another key objective of the International Ocean Network (ION). ION was founded to meet a critical need for long-term geophysical observatories in the deep ocean to fulfill two major scientific goals: 1) uniform coverage of global terrestrial processes, and 2) long-term monitoring of active processes. The Western Pacific is the best-suited region on Earth to investigate the surface manifestations of subducting plates, from formation and evolution of island arcs and marginal seas to earthquake phenomena, and their relation to mantle convection. Leg 191 will drill one of the high-priority areas identified by ION in the Western Pacific (WP-2). A downhole seismometer will be installed at this site located seaward of the Japan trench to expand the observatory network. The objectives of the long-term observatory at Site WP-2 are to provide: 1) seismic tomography of the lithosphere, 2) constrains on the structure of the Pacific oceanic plate and underlying mantle, and 3) to determine MORB chemistry to constrain the cooling and subsidence history of the old oceanic lithosphere. This observatory will also provide unique seismic observations on the seaward side of the Japan Trench.

FY 2001 Drilling Program Development

At its August 1999 meeting, SCICOM considered all of the externally reviewed proposals that had been carried forward from last year and those forwarded to it by the Science Steering and Evaluation Panels (SSEPs). The proposals were considered in terms of their relationship to the objectives and priorities of the Long Range Plan (LRP). The LRP identifies fundamental scientific problems under two major research themes: Dynamics of the Earth's Environment and Dynamics of the Earth's Interior. Before ranking the proposals, SCICOM discussed the status of investigations of the scientific topics under these two themes.

Proposals 431-Rev (West Pacific Seismic Network) and 517-Full (Second Leg of W. Nankai) had already been considered and highly ranked last year, they were forwarded to OPCOM before ranking the remaining proposals:

SCICOM Motion 99-2-7
SCICOM forwards Proposal 431-Rev to OPCOM without ranking, so as to complete an already highly ranked proposal.

SCICOM Motion 99-2-8
SCICOM forwards Proposal 517-Full to OPCOM for scheduling the second leg of W. Nankai, based on the SSEPs and SCICOM reviews of the scientific plan and contingent upon successful drilling operations during Leg 190 (see SCICOM Motion 98-2-7). SCICOM also encourages the proponents to continue to seek funding to offset the costs of this very expensive leg. SCICOM expects that ODP/TAMU will continue to develop the advanced CORKs and have them completely ready for use by the beginning of the leg. If not, SCICOM views it as critical that the LWD work proceeds as scheduled.

Concerning 517-Full, the Second Leg of W. Nankai SCICOM passed a special motion regarding the development and deployment of advanced CORKs:

SCICOM Motion 99-2-9
SCICOM views the timely development and testing of the advanced CORK system as critical to achieving the objectives of drilling at the Nankai accretionary prism. SCICOM therefore instructs OPCOM to work closely with JOI and ODP/TAMU to ensure that development proceeds appropriately. SCICOM also requests that JOI and ODP-TAMU present at the next SCICOM meeting a timeline for development and testing of the advanced CORKs.

SCICOM also considered the problem of repeated ranking of proposals that were far from the area foreseen for operations, and passed the following motion:

SCICOM Motion 99-2-10
SCICOM expresses concern about highly ranked proposals (those forwarded to OPCOM) that clearly lie outside the projected area of ship operations for several years yet receive a new global scientific ranking each year. Such proposals inevitably slip in rank because of the higher priority placed on those proposals with a geographic urgency to schedule. SCICOM therefore adopts the following procedure:
1) Every proposal, regardless of its geographic location, will receive a global scientific ranking when first reviewed by SCICOM.
2) If OPCOM does not schedule a highly ranked proposal primarily because it lies outside the projected area of ship operations, SCICOM will not automatically re-rank that proposal the following year. When the possibility arises to schedule such a proposal, SCICOM may request the proponents to submit an update, in the form of either an addendum or a revised proposal (not subjected to further external review), for consideration at the spring meeting of the SSEPs.

SCICOM members voted by closed ballot to establish a global scientific ranking of the 19 proposals remaining:

Rank	Proposal	Title
1.	523-Full	Hawaii-Emperor Seamounts
2.	465-----	SE Pacific Paleoceanography
3.	486-Rev2	Paleogene Equatorial Pacific
4.	525-Full	Mid-Atlantic Ridge Peridotite
5.	500-Full2	H2O Long-Term Seafloor Observatory
6.	499-Rev	ION Equatorial Pacific
7.	546-Full	Hydrate Ridge
8.	505-Full3	Mariana Convergent Margin
9.	534-Full	Shatsky Rise
10.	510-Full3	Marion Plateau
11.	489-Full2	Ross Sea
12.	553-Full	Cascadia Margin
13.	451-Full5	Tonga Forearc
14.	535-Full2	735 Deep--Slow Spreading Ridge
15.	477-Full2	Okhotsk and Bering Seas
16.	549-Full	Arabian Sea OMZ
17.	478-Full4	Eastern Nankai (Part A)
18.	478-Full4	Eastern Nankai (Part B)
19.	355-Full7	Peru Margin

SCICOM then voted to forward the top ten to OPCOM for possible scheduling:

SCICOM Consensus 99-2-11
SCICOM decides to forward the top ten ranked proposals to OPCOM for possible scheduling. See above for a complete list of proposal rankings.

After considering scheduling and operational matters, OPCOM returned three alternative plans to SCICOM for discussion. SCICOM considered these and approved the following schedule:

SCICOM Motion 99-2-21
SCICOM approves the drilling schedule for 2001 and beyond, as shown below. This schedule could change to take advantage of optimal weather windows, but all projects will be scheduled.

510-Full3	Marion Plateau
431-Rev	W Pacific Network - WP-1
517-Full	Nankai (LWD + CORKs)
523-Full	Hawaii-Emperor Seamounts
546-Full	Hydrate Ridge
500-Full2	H2O Observatory
486-Rev2	Paleogene Equatorial Pacific
465----	SE Pacific Paleoceanography

Included in the 2001 drilling is also Manus Basin, which had been scheduled last year.

The relationship of these proposals to the major themes of the LRP is as follows:

Dynamics of the Earth's Environment:

The Marion Plateau program will make a major contribution toward understanding the effects of sea-level change on sedimentary systems by defining the absolute magnitude of the major Middle Miocene sea-level fall and the magnitude of younger sea-level changes. It will also contribute to understanding the effects of sea-level change on carbonate sedimentary systems.

Drilling at Hydrate Ridge will investigate the physical properties of gas hydrates and the associated sediments in a region where there is a large supply of methane.

The Paleogene Equatorial Pacific Leg will explore the peculiar conditions that existed in the Pacific during the early Cenozoic when the Earth's meridional temperature gradient was at a minimum, and when the equatorial sedimentation system behaved very differently from today.

Although the Hawaii-Emperor Seamounts Leg is primarily directed toward understanding the nature of hotspots, it will contribute important information on the orientation of the Pacific plate during the Early Cenozoic, aiding in the interpretation of paleoenvironmental data.

Dynamics of the Earth's Interior:

Manus Basin is unique as an oceanic hydrothermal system in that it is hosted in acidic rocks. It bears a much closer relation to many continental ore deposits than the basalt-hosted hydrothermal systems associated with the mid-ocean ridge.

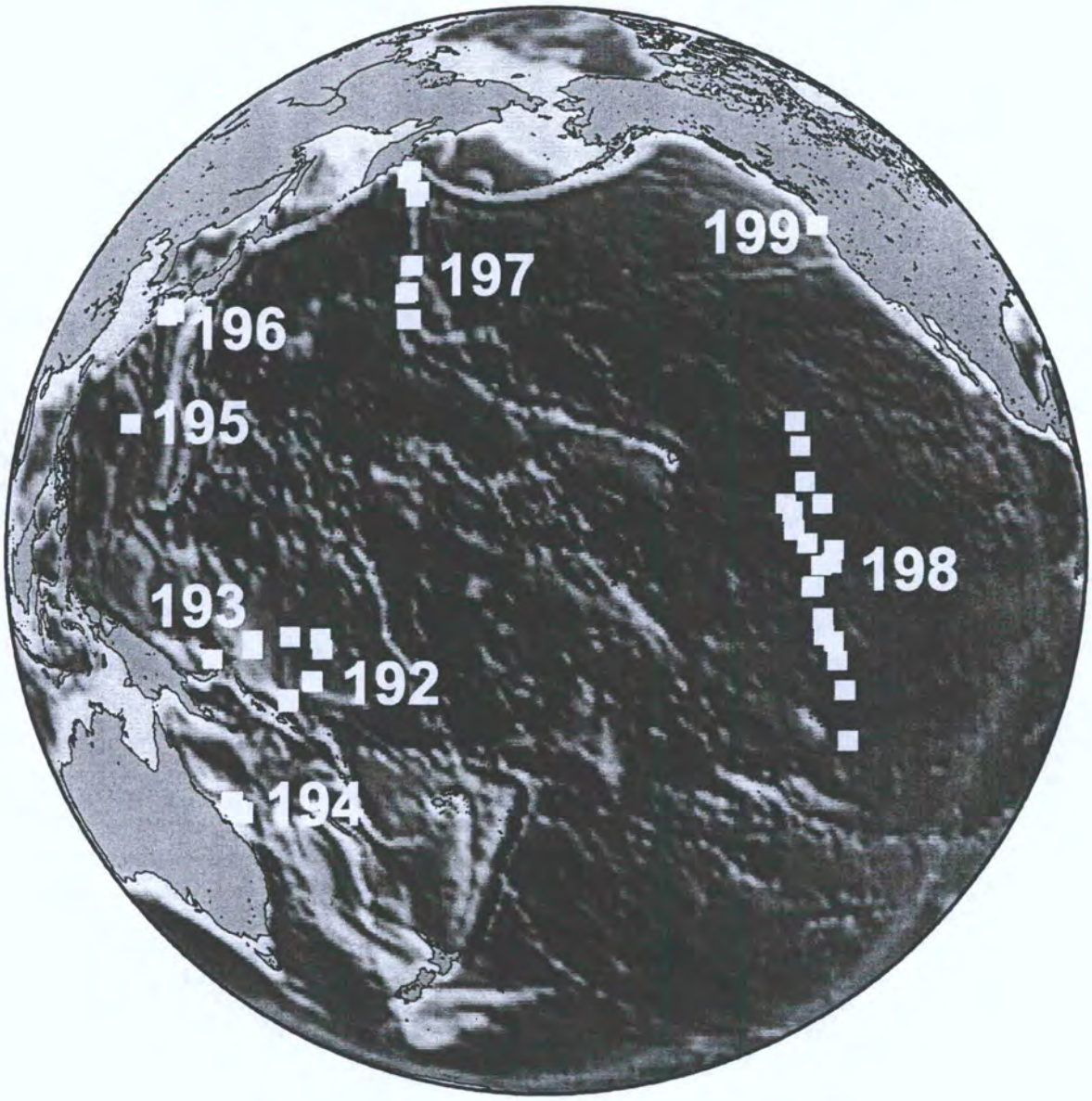
The W Pacific Network – WP – 1 and H2O Observatory sites will fill major gaps in the global seismic monitoring program.

Nankai II will use Logging While Drilling (LWD) and advanced CORKs to develop a more quantitative understanding of hydrogeologic, geochemical and tectonic processes on a convergent margin.

The study of Hawaii-Emperor Seamounts will explore an important aspect of mantle dynamics by providing a test of the hypothesis that deep-seated mantle hotspots are not fixed, but move with time.

FY 2001 Drilling Leg Descriptions

Figure PP-5: FY 2001 Drilling Leg Locations (Legs 192-199)



Leg 192 carries over from FY 2000 into FY 2001. It was included in the FY 2000 Program Plan, and the information below is repeated for completeness

LEG 192	**Ontong-Java Plateau**
Proposal	**448-Full4**
Title	**Assessing the Origins, Age, and Post-Emplacement History of the Ontong Java Plateau through Basement Drilling Origin/Post-Emplacement History of Ontong Java Plateau**
Proponents	**L.W. Kroenke, J. Mahoney, A.D. Saunders, G. Ito, P. Wessel, D. Bercovici, T. Gladczenko, O. Eldholm, L. Abrams, R. Larson, M. Coffin and A. Taira**

The importance of oceanic volcanic plateaus has become widely appreciated by the earth science community in the last several years. Many of these large igneous provinces (LIPs) represent immense volumes of magma erupted on the seafloor in fairly short time periods, and emplacement rates of the largest ones may have approached the entire magma production rate of the global mid-ocean ridge system. In fact, the Alaska-sized Ontong-Java Plateau in the western Pacific may represent the largest igneous event of the last 200 my. The construction of LIPs, and their effects on subduction patterns, continental growth and crust evolution, ocean circulation, and global climate are only beginning to be understood, but are clearly very significant in some cases.

Leg 192 is the first in a proposed two-leg program aimed at understanding the formation of the world's largest plateau. A transect of drill holes into basement across the Ontong Java Plateau will be drilled to determine its age and duration of emplacement, the range and diversity of magmatism, the environment of eruption and post-emplacement vertical tectonic history of the plateau, the effects of rift-related tectonism, and the paleolatitude of the OJP at the time(s) of emplacement.

Drilling Plan

Four drilling sites are proposed in 1590-3715 m water depth, each with 100-150 m basement penetration. The holes will be RCB cored through 830-1305 m of sediment and 100-150 m into basement, and logging will occur. The estimated cored interval is 1700 m with 850 m recovered. Combined with results from previous drilling, this will complete the broad areal survey phase, and provide the basis for possible further drilling at some future date. Due to the long lead-time in procuring drilling supplies and shipping to a distant port, funds were partially budgeted in FY00 for this leg.

Logging Plan

The tectonic, structural and geochemical objectives of this oceanic plateau study will particularly benefit from log data. As the main aim of this proposal is to obtain a spatial coverage of basement compositional variations, of age and paleodepth of both the main body of the plateau and its eastern salient, standard geophysical logs will be run on each hole, as well as the Formation MicroScanner (FMS) for structural and tectonic purposes.

While the recording of in-situ physical properties data is essential to core-log integration studies, the conventional logs are also useful to provide a continuous lithological and acoustic characterization of penetrated structures and to determine the lithostratigraphy of the logged sequence (e.g., the presence and thickness of lava flows and massive units).

The FMS images will contribute to a detailed description of tectonic features by a clear identification of the succession of basement units. The FMS electrical images will give the necessary high-resolution (cm-scale) for accurate description of tectonic features, in terms of lithological boundaries, bedding attitude (dip and strike), presence of fractures and faults and their spatial orientation, and degree of alteration of basement features. Detailed comparison of spatially-oriented FMS images with core images (slabbed and/or circumferential core scans) should be useful for core orientation and analysis of structural and magnetic measurements on core.

Detailed information on the velocity structure of the plateau will be necessary for correlation between borehole data and seismic reflection data and to understand the regional distribution of igneous activity. Sonic logs calibrated with WST check shot surveys should provide for precise determination of the velocity structure at the OJP drill sites.

Table PP-3: Leg 192 Drill Site Locations

Site Name	Latitude (°S)	Longitude (°E)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
OJ3B	1°10.62'	157°00.89'	1800	1000	200	1200
OJ3C	2°05.3266'	157°00.749'	1590	900	200	1100
OJ6B	7°28.224'	161°05.9932'	1860	590	200	790
OJ6C	7°13.044'	161°17.531	1705	630	200	830
OJ7D	4°56.9583'	164°16.2656'	2003	1200	200	1400
OJ7E	4°56.2177'	164°09.2950'	1635	1305	200	1505
OJ9C	0°17.196'	165°18.132'	4396	1000	100	1100
OJ9D	1°25.31'	165°28.146'	4442	800	100	900
OJ11C	0°21.4569'	161°40.0636'	3915	330	200	530

Figure PP–6: Leg 192 Drill Site Locations

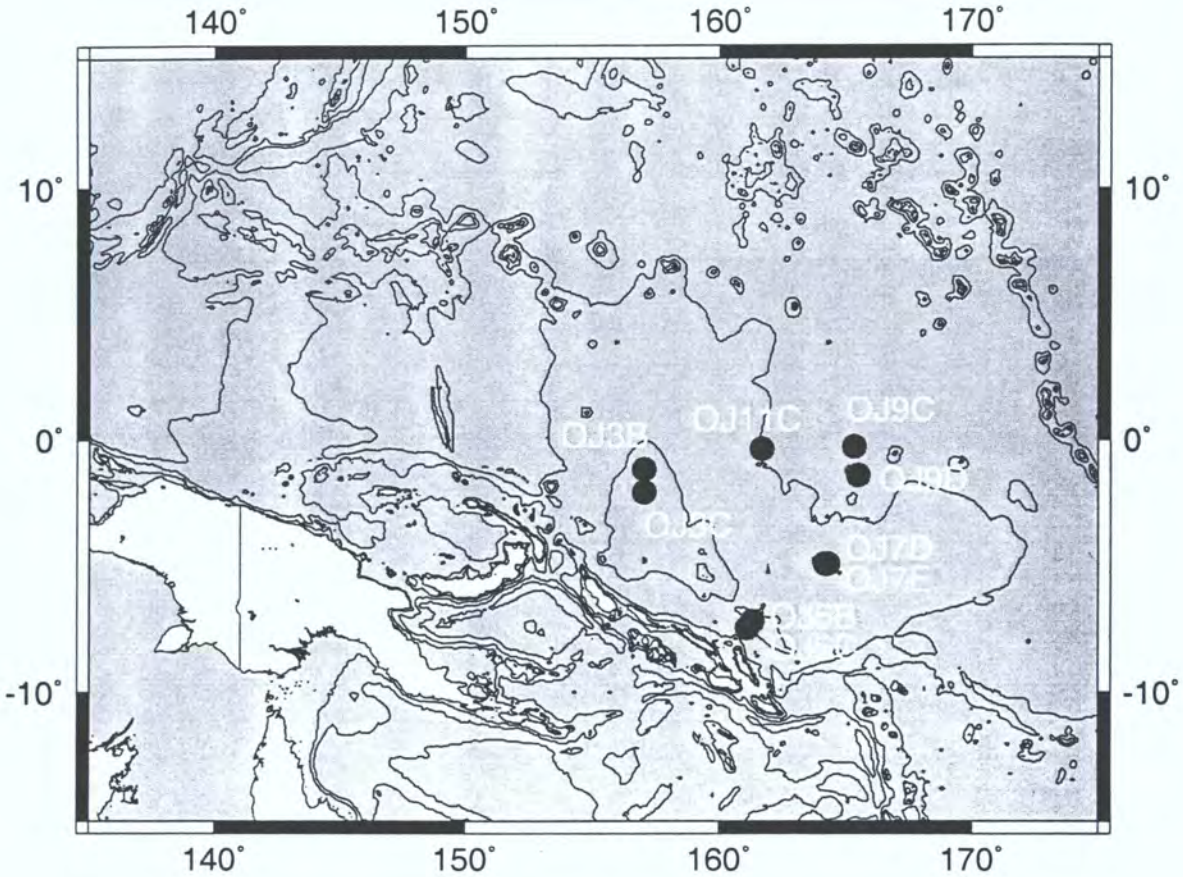


Table PP-4: Leg 192 Budget *

Expense Category	Description	TAMU	LDEO**
2000	Payroll/Salary	333,706	13,764
3500	Travel	8,267	4,822
3533	Drilling Clearances	0	0
3580	Travel to/from Port	6,812	3,654
3600	Training	4,962	0
3750	Travel - ODL	67,021	0
3760	Per Diem	47,049	1,315
4000	Supplies	8,184	2,532
4750	Fuel	0	0
5070	Insurance	64,438	16,201
5261	Shipping	24,586	10,404
5370	Communications	4,164	0
5373	Ship-to-Shore Communications	7478	1,320
5550	Services	6,921	0
5590	Computing Services	1,922	0
5931	Equipment Rental	7,517	0
5981	Other Expenses – ODL	123,066	0
6820	Repairs & Maintenance	9,383	7,283
7040	Day Rates	564,824	232,160
7090	Port Calls	0	0
8400	Equipment	9,542	1,359
	Logging Operations	0	30,764
	Sub Total	1,299,842	325,578
	Logging Deployment SOE	0	0
	Grand Total	**$1,299,843**	**$325,578**

* Refer to pages PP-56 for a glossary of expense category terms

** Part of the Leg 192 budget was included in the FY 00 Program Plan

Leg 193	**Manus Basin**
Proposal	**479 Full2**
Title	**Anatomy of a Felsic Volcanic-Hosted Hydrothermal System: Eastern Manus Back-Arc Basin**
Proponents	**R.A. Binns and S.D. Scott**

One of the major goals of the Long Range Plan is to understand interactions between ocean water and hot crustal material in hydrothermal systems. Most hydrothermal systems are associated with the Mid-Ocean Ridge system and involve seawater-basalt interactions. Manus Basin provides a unique opportunity to investigate another class of hydrothermal system, one in which the reactions occur between seawater and acidic volcanic rocks.

The objectives of Leg 193 are to study the magmatic-fluid interactions in a felsic volcanic-hosted hydrothermal system. This will be accomplished by: 1) looking at mineralogical, geochemical, and isotopic analyses of mineralized veins and alteration intervals below outflow zones; 2) comparing investigations below shallow and deep inflow zones, particularly using isotopes for tracing the deposition of seawater derived anhydrite and; 3) performing quantitative modeling of the entire hydrological system using physical and chemical constraints derived from studies of core samples and wall structures of the boreholes.

Drilling Plan

The hydrothermal field will be cored with four sites in 1655-2139 m water depth. Two sites will be cored with the RCB to 300 m. Two sites will be RCB cored to 500-700 m. The holes are in a hot active hydrothermal system with possible H_2S safety problems. The estimated cored interval is 1539 m with recovery estimated at 750 m. The ADCB may be deployed for testing on Leg 193.

Logging Plan

The logging program for the Leg 193 is designed to obtained physical, chemical, and structural data that will be essential for characterizing hydrological parameters, lithological boundaries, and structural features that constrain this hydrological system. In case of poor core recovery, resistivity, gamma ray, and density log profiles will help define the extent of mineralization in the boreholes much more accurately than core recovery alone. Formation MicroScanner (FMS), resistivity and porosity data will allow the definition of fracture patterns associated with potential permeable zones and hydrothermal fluid flow. In addition, array acoustic waveform data containing low-frequency Stoneley waves can be used for the detection of permeable fractures and the estimation of fracture hydraulic conductivity.

The strategy that ODP has adopted and used in potentially high-temperature (>165°C) holes in the past (i.e. TAG site, Juan de Fuca ridge, 504B) is that "hole cooling during drilling" will sufficiently depress borehole temperatures into the sustainable range such that most of the standard logging tools can be used. Using the side-entry sub (with some extra time) allows for hole cooling by pumping during logging operations. Standard logging tools can be run reliably to approximately 165°C. The LDEO and/or University of Miami high-T temperature tools are recommended for use at elevated borehole temperatures.

In the event that hole conditions are poor, the LWD resistivity and gamma ray tool (CDR) will be available. Since key mineralization zones are located immediately below the seafloor, the CDR will allow these shallow (<90 mbsf) zones to be logged with minimal hole degradation, since it is obtained without stopping to recover core, reducing the chances of borehole wall collapse. The CDR records gamma ray and borehole compensated deep and shallow resistivity measurements that will permit correlation between holes and an assessment of lithology and fracturing. The temperature limit for the CDR is 150°C, but pumping while drilling with LWD should cool the hole continuously and significantly more than during wireline logging.

If additional funding becomes available, a more robust approach can be achieved by deploying resistivity-at-the-bit (RAB) and/or azimuthal density neutron (ADN) tools. These LWD tools measure azimuthal density and reliable neutron porosity (ADN) in high-porosity environments and provide at-the-bit resistivity (RAB) and resistivity images, which are similar to an FMS log. The resistivity and density azimuthal data, as well as measurements that are made at the bit itself, can be particularly valuable for investigations of macrostructures within faults or fractures since the data are obtained before any significant hole degradation or pore pressure changes occur. With this enhanced LWD approach, the ephemeral and physical properties in fractured environments can be observed and more accurately interpreted.

Table PP-5: Leg 193 Drill Site Locations

Site Name	Latitude (°S)	Longitude (°E)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
PCM-1A	3°43.293'	151°40.583'	1720	700	0	700
PCM-2A	3°43.69'	151°40.20'	1655	500	0	500
PCM-3A	3°43.23'	151°40.52'	1696	300	0	300
PCM-4A	3°44.45'	151°40.76'	2139	350	0	350

Figure PP-7: Leg 193 Drill Site Locations

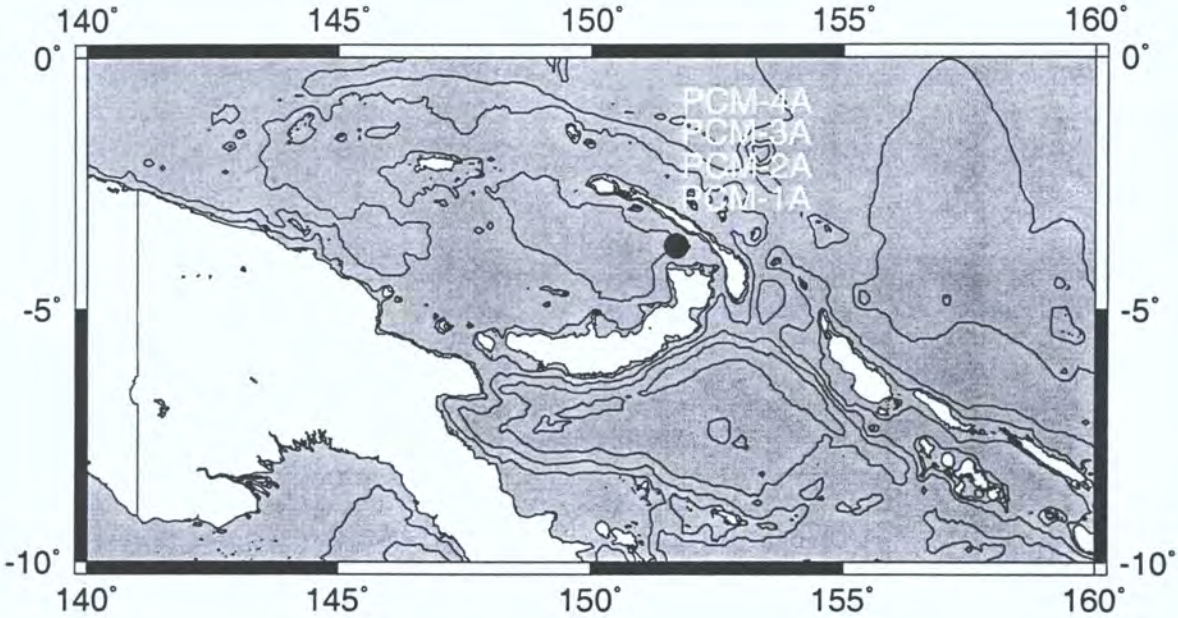


Table PP-6: Leg 193 Budget

Expense Category	Description	TAMU	LDEO
2000	Payroll/Salary	541,754	31,763
3500	Travel	11,417	6,992
3533	Drilling Clearances	4,060	0
3580	Travel to/from Port	23,058	10,985
3600	Training	9,974	0
3750	Travel - ODL	169,439	0
3760	Per Diem	65,996	1,907
4000	Supplies	136,175	3,671
4750	Fuel	266,668	0
5070	Insurance	88,986	23,492
5261	Shipping	77,067	15,086
5370	Communications	5,922	0
5373	Ship-to-Shore Communications	10,205	1,978
5550	Services	10,922	0
5590	Computing Services	2,654	0
5931	Equipment Rental	22,833	0
5981	Other Expenses – ODL	169,948	0
6820	Repairs & Maintenance	32,893	10,560
7040	Day Rates	2,826,118	336,632
7090	Port Calls	162,775	0
8400	Equipment	20,311	1,970
	Logging Operations	0	66,026
	Sub Total	**4,659,175**	**511,062**
	Logging Deployment SOE *		135,000
	Grand Total	**$4,659,175**	**$646,062**

* LWD-Lite

Leg 194	**Marion Plateau**
Proposal	**510-Full3**
Title	**Sea-Level Magnitude and Variations Recorded by Continental Margin Sequences on the Marion Plateau, Northeast Australia**
Proponents	**A.R. Isern, C.J. Pigram, D. Muller and F. Anselmetti**

Cretaceous rifting in the western Coral Sea formed a number of continental fragments, which are now capped by carbonate platforms. Leg 194 will drill a series of holes on one of these fragments, the Marion Plateau. The drilling will address the causes, magnitudes, and effects of sea-level change on continental margin sediments — a major objective of the ODP Long Range Plan. Specifically, the drilling transect on the Marion Plateau will investigate the Miocene sea-level variations and their influence on continental margin sediments. The Leg will build on the achievements of earlier ODP drilling in the region (Leg 133), targeting sequences with a high likelihood of successfully resolving major scientific problems. This program builds on the results of previous sea-level legs in the Bahamas and on the New Jersey Margin.

It is widely accepted that sea-level fluctuations are fundamental in controlling the nature and geometry of continental margin deposition, but much of our knowledge is qualitative. The program on Marion Plateau is designed to provide quantitative information that can be used to calibrate the global sea-level curve. This region provides a unique opportunity to determine the absolute magnitude of one of the major Cenozoic sea-level falls.

The drilling strategy outlined for the Marion Plateau utilizes the stratigraphic relationship between an early to middle Miocene and late Miocene second-order highstand carbonate platform complexes to determine the absolute magnitude of the middle Miocene N12-N14 sea-level fall. The middle Miocene sea level fall caused a shift in the locus of carbonate platform deposition. The sites to be drilled lie along a single strike line on a single structural element. Thermal subsidence of the platform should have affected all sites equally, enabling an accurate measure of the amplitude of the sea-level fall.

In addition to the N12-N14 sea-level fall, the Marion Plateau also has an excellent overall Miocene sea level record including a complete third order event stratigraphy between 30-4 Ma.

Drilling Plan

The proposed transect includes seven primary sites to obtain complete sediment sections of the MP2 and MP3 platform phases (two sites), and proximal (two sites) and distal (three sites) slope facies to provide the stratigraphic framework. Water depths for the sites vary between 293 and 363 m, and penetrations to basement are 570 to 720 m depth. All holes will be wireline-logged. Operations will be conducted under ODP's shallow water guidelines. The sites are near the Great Barrier Reef in an environmentally sensitive area. Recovery of unconsolidated sand and reef debris may result in low core recovery. The estimated cored interval is 5060 m with a recovery of 3325 m.

Logging Plan

The success of Leg 194 depends on the ability to correlate between all of the sites well, and map the facies into a common, well-dated stratigraphy, which is integrated with the seismic data. In order to accomplish this, standard logs (gamma, density, resistivity, porosity) combined with detailed sonic and WST logs will be required. High-resolution log data, in particular FMS images and the 3rd party high-resolution gamma tool (if available), will be useful for cyclo-stratigraphic analysis of the margin sequences.

Table PP-7: Leg 194 Drill Site Locations

Site Name	Latitude (°S)	Longitude (°E)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
CS-01A	19°55.6'	151°36.2'	354	684	10	694
CS-02A	19°49.8'	151°54.7'	363	616	10	626
CS-03A	20°48.0'	152°17.7'	318	590	10	600
CS-04A	20°55.7'	152°37.8'	319	600	10	610
CS-05A	20°58.1'	152°44.6'	309	560	10	570
CS-06A	20°58.6'	152°46.1'	293	710	10	720
CS-07A	21°03.7'	153°01.6'	326	600	10	610
CS-08A	21°04.3'	153°03.2'	326	570	10	580

Figure PP-8: Leg 194 Drill Site Locations

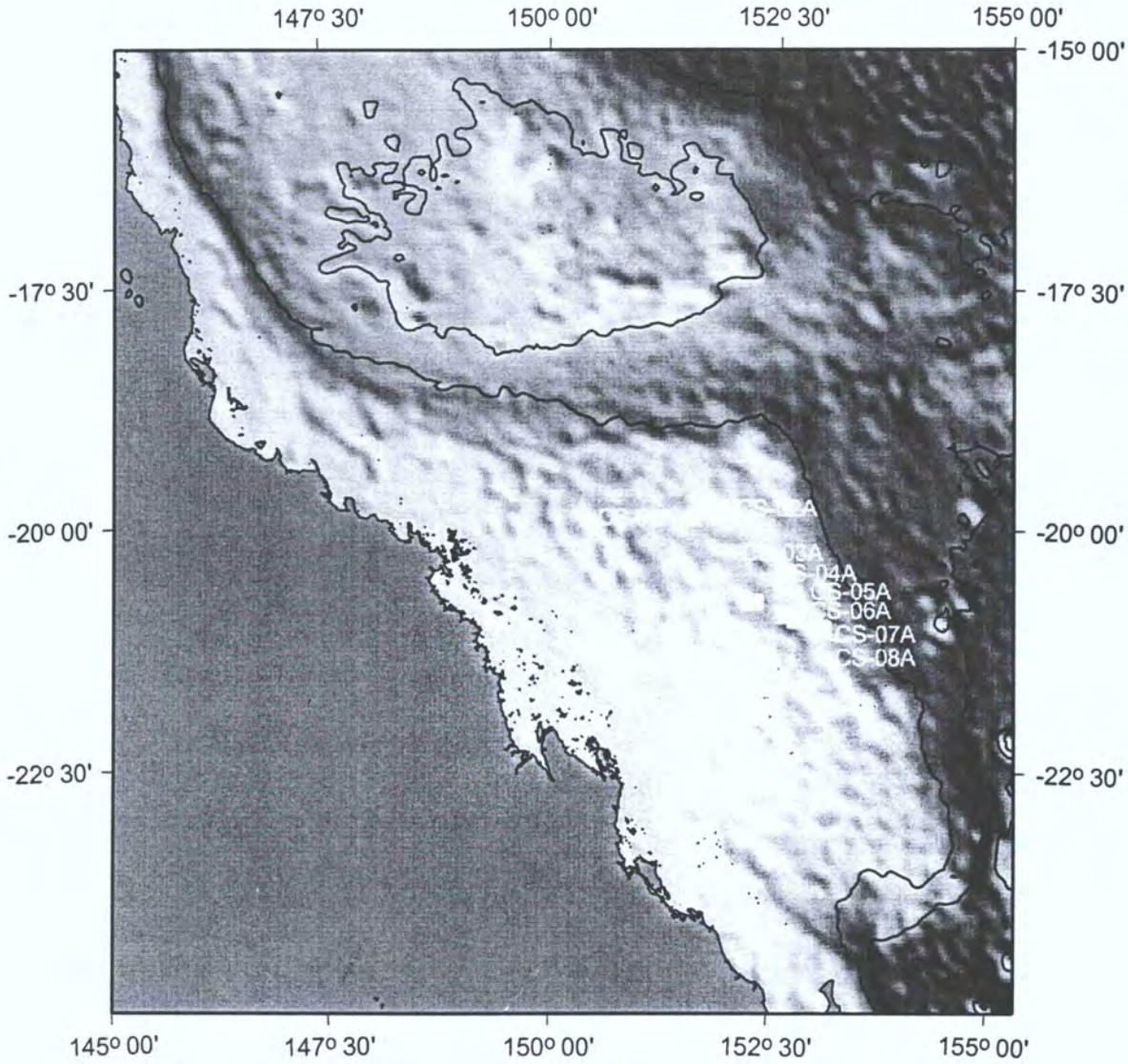


Table PP-8: Leg 194 Budget

Expense Category	Description	TAMU	LDEO
2000	Payroll/Salary	522,283	37,518
3500	Travel	10,826	6,630
3533	Drilling Clearances	0	0
3580	Travel to/from Port	92,850	9,388
3600	Training	9,682	0
3750	Travel - ODL	177,071	0
3760	Per Diem	62,633	1,808
4000	Supplies	204,920	3,481
4750	Fuel	266,668	0
5070	Insurance	84,384	22,277
5261	Shipping	77,018	14,306
5370	Communications	5,787	0
5373	Ship-to-Shore Communications	9,688	1,888
5550	Services	12,185	0
5590	Computing Services	2,516	0
5931	Equipment Rental	18,933	0
5981	Other Expenses – ODL	161,158	0
6820	Repairs & Maintenance	32,525	10,014
7040	Day Rates	2,674,734	319,220
7090	Port Calls	157,812	0
8400	Equipment	19,932	1,868
	Logging Operations	0	70,564
	Sub Total	**4,603,605**	**498,962**
	Logging Deployment SOE		0
	Grand Total	**$4,603,605**	**$498,962**

Leg 195	**WP Seismic Network**
Proposal	**431**
Title	**W. Pacific Seismic Network**
Proponents	**K. Suyehiro, H. Fujimoto, T. Kanazawa, J. Kasahara, Y. Fukao, H. Momma, K. Fujioka, T. Matsumoto, H. Kinoshita, S. Sacks and A. Linde**

Plate consuming boundaries are concentrated in the Western Pacific area. It is the most suitable region to study the dynamics of plates undergoing subduction, formation and evolution of island arcs and marginal seas, and the relation of these processes to mantle convection. Over the past years a dense regional geophysical network has been established on the land areas. The network in Japan is one of the densest sets of seismic stations in the world, and good coverage extends throughout eastern Asia. However, the land network needs to be supplemented by stations that can provide data from the mid-ocean floor and from the plate subduction boundary. Development of the ocean seismic network is proceeding through ODP boreholes that are outfitted as long-term geophysical observatories. They provide unique seismic data hitherto unavailable. These data will help to quantify the dynamics of subducting plates from their entry into the mantle to their destruction in the deep mantle.

The proposal for the Western Pacific Geophysical Network called for two sites which had been endorsed by the International Ocean Network (ION). The long-term ocean seismic observatory network was included as an initiative in the ODP Long Range Plan (LRP) as a contribution to the Global Seismic Network. The GSN has been successful in resolving the earth's interior from land and island based seismic installations, but still lacks coverage in large areas of the oceans. Two Western Pacific sites are designed to aid study of earthquake dynamics, the dynamics of the subducting plates, the formation of island arcs, and the relation of these processes to mantle convection. The first of the sites is scheduled for drilling during FY 00 and the second is scheduled here for drilling in 2001. Long-term seismic observatories will be installed at both sites. Both observatories are to be connected to nearby telecommunications cables in the future.

Drilling Plan

The water depth is 5697 m. One hole will be APC/XCB cored to basement, and a second hole will be RCB cored 100 m into basement. A reentry cone will be set with 70 m of 16 in casing and 450 m of 10-3/4 in casing. The ION hole is now planned for completion with a 4-1/2 in casing and a seismometer package. A quiet and stable borehole is required for installation of the long-term seismic observatory

Logging Plan

The logging program is designed to measure physical properties, anisotropy, and hole shape, objectives that are quite similar to the objectives at the Japan Trench sites during Leg 186. To be effective in locating and evaluating intervals in such holes, logs must be acquired prior to installation of any downhole instrumentation. The laterolog will measure resistivity in basement intervals. Standard geophysical logs can be used to measure physical properties; hole volume can be estimated with high accuracy using the UBI log (acoustic

televiewer) in the basement intervals. This will significantly improve grouting procedures for the strain sensors and emplacement for the seismometers. High-resolution temperature logs should be emphasized to identify permeable zones and in-flow/out-flow from both drilling-induced and natural fractures in the holes. (Note: Use of the UBI is pending evaluation of Leg 191 UBI results.)

Table PP-9: Leg 195 Drill Site Location

Site Name	Latitude (°N)	Longitude (°E)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
WP-1A	19°30'	135°0.06'	5715	100	370	470

Figure PP-9: Leg 195 Drill Site Location

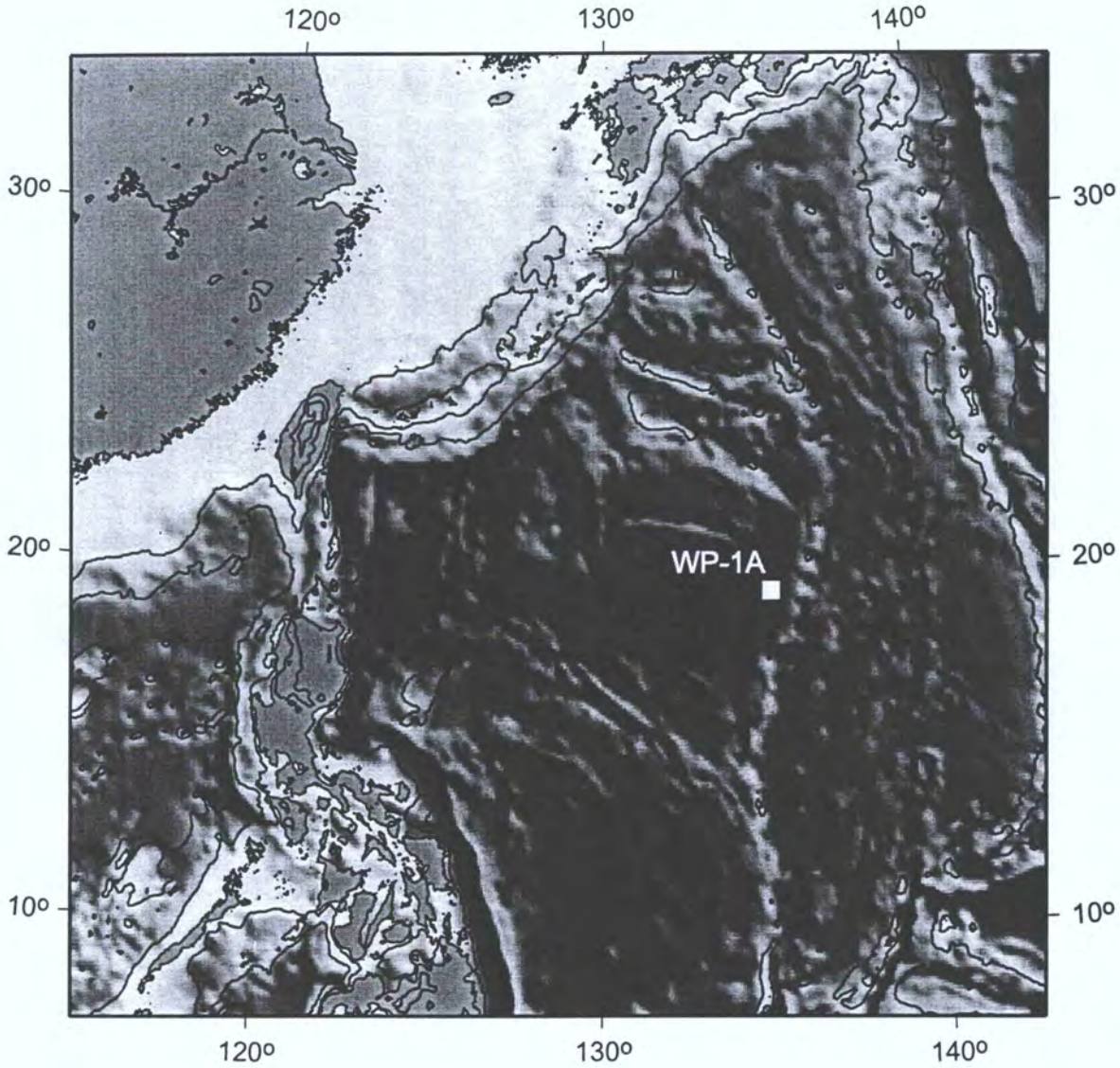


Table PP-10: Leg 195 Budget

Expense Category	Description	TAMU	LDEO
2000	Payroll/Salary	381,300	18,687
3500	Travel	7,283	4,460
3533	Drilling Clearances	0	0
3580	Travel to/from Port	69,202	5,472
3600	Training	6,185	0
3750	Travel - ODL	117,129	0
3760	Per Diem	42,455	1,216
4000	Supplies	153,019	2,342
4750	Fuel	266,666	0
5070	Insurance	56,767	14,986
5261	Shipping	65,109	9,624
5370	Communications	4,260	0
5373	Ship-to-Shore Communications	7,083	1,345
5550	Services	8,563	0
5590	Computing Services	1,693	0
5931	Equipment Rental	15,033	0
5981	Other Expenses – ODL	108,415	0
6820	Repairs & Maintenance	24,839	6,737
7040	Day Rates	1,797,771	214,748
7090	Port Calls	162,726	0
8400	Equipment	13,094	1,257
	Logging Operations	0	39,149
	Sub Total	**3,308,592**	**320,023**
	Logging Deployment SOE *		69,055
	Grand Total	**$3,308,592**	**$389,078**

* UBI, DLL (Note: Use of the UBI is pending evaluation of Leg 191 UBI results.)

Leg 196	**Nankai Trough LWD & A-CORKS**
Proposal	**517-Full**
Title	**Nankai Trough LWD / Advanced CORK Experiments**
Proponents	**K. Becker, E. Davis, G. Moore, M. Kinoshita, T. Gamo, A. Taira, H. Tokuyama, K. Suyehiro, M. Yamano, E. Kikawa, T. Matsumoto, H. Kinoshita**

This is the second leg of the Nankai Trough program designed to investigate hydrogeologic, diagenetic, and tectonic processes in an accretionary prism. Nankai Trough is a classic example of a convergent margin where a thick section of clastic sediment is being accreted. It is known for its structural simplicity, shown in excellent high-resolution seismic profiles. Leg 196 will be devoted principally to LWD (Logging-While-Drilling) and installation of Advanced CORK hydrologic observatories, at sites either scheduled to be cored during ODP Leg 190 in 2000 or cored previously during Leg 131. The observations resulting from this leg and later gleaned from the CORK observatories will help develop rigorous mechanical, geochemical and hydrologic models of fluid-related diagenetic and tectonic processes rapidly deforming accretionary wedges.

New features of Advanced CORKs include a multi-level isolation/monitoring/testing capability essential to understanding the fluid flow regime at the Nankai accretionary prism. They also include provision for future deployment of instrument strings by wireline vehicle.

Drilling Plan

Four sites, located along a transect in the eastern Nankai Trough will be studied and instrumented on Leg 196. The LWD program will determine the physical properties and structure at each site. The A-CORK seals are configured to determine elastic and hydrologic parameters and to monitor fluid flow processes in the frontal and proto-thrust zones, the decollement and proto-decollment, the sediments above and below the decollement, and the upper oceanic basement of the downgoing plate. Leg 196 will also study a comparative site in the western proto-thrust region. Following the leg, a wireline reentry system will be used to download pressure data from the A-CORKs. The reentry system will then install thermistor-tiltmeter-seismometer instrument strings in the A-CORKs, geochemical monitoring systems on the fluid sampling ports, and set up coordinated seafloor monitoring systems. Ultimately, links to fiber-optic cables on the seafloor may extend the lifetimes of these experiments from several years to decades. With such long-term monitoring of multiple parameters at multiple sites it will be possible to study strain and changes in the hydrology and mechanical properties of the Nankai accretionary prism through a significant part of the subduction thrust earthquake cycle.

Logging Plan

State-of-the-art LWD tools are requested and should be used to measure high-quality porosity and density (ADN) logs from the seafloor to TD, to measure resistivity images, similar to FMS images, and gamma radiation at the bit (RAB). As demonstrated by the results from Leg 156, 170, and 171A, the information acquired from these LWD logs will also allow in-situ pore pressures within the accretionary prism to be inferred.

The Resistivity-at-the-bit (RAB) tool will acquire azimuthal resistivity images of the borehole to detect resistivity heterogeneity and borehole structures (fractures and stratigraphic contacts - like FMS but lower resolution), total gamma-ray measurements for lithology estimation, and four depths of investigation.

The Azimuthal Density Neutron (ADN) tool will provide borehole-compensated formation density, neutron porosity, and photoelectric factor measurements in four quadrants around the borehole. A mini-leg strategy is recommended to maximize operational time for approximately 2200 m total penetration at four selected sites with water depths ranging from 3022 to 4850 m.

Table PP-11: Leg 196 Site Locations

Site Name	Latitude (°N)	Longitude (°E)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
ENT-1A	32°14.14'	135°01.87'	4760	700	0	700
ENT-3A	32°20.30'	134°57.25'	4730	1150	0	1150
ENT-6A	32°34.49'	134°40.31'	3045	800	0	800
ENT-7A	32°36. 03'	134°38.42'	3022	800	0	800
WNT-01A	31°43.878	133°56.85'	4850	700	0	700

Figure PP-10: Leg 196 Drill Site Locations

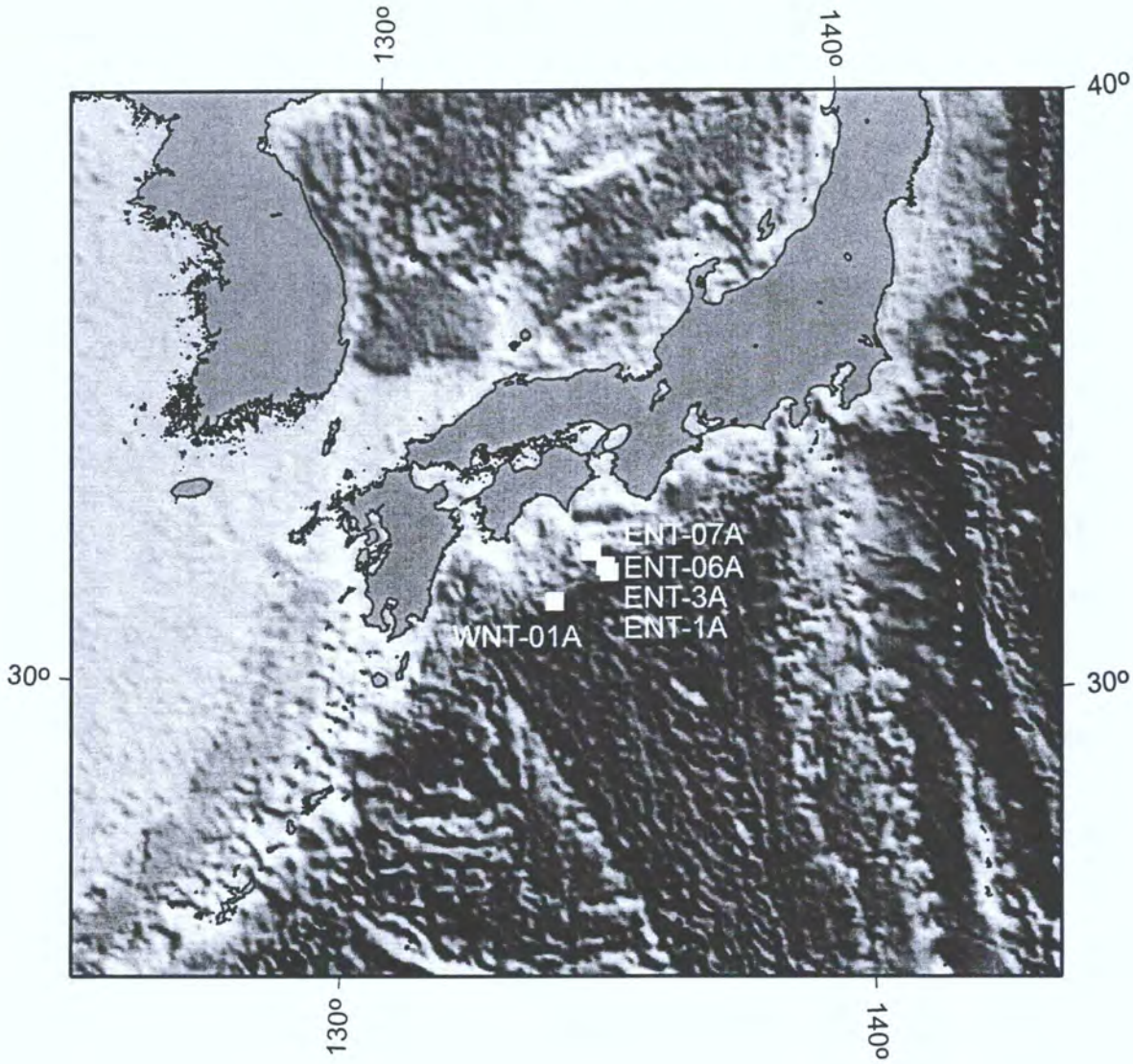


Table PP-12: Leg 196 Budget

Expense Category	Description	TAMU	LDEO
2000	Payroll/Salary	537,909	36,275
3500	Travel	11,811	7,233
3533	Drilling Clearances	0	0
3580	Travel to/from Port	74,105	3,686
3600	Training	10,314	0
3750	Travel - ODL	156,861	0
3760	Per Diem	68,238	1,973
4000	Supplies	948,846	3,797
4750	Fuel	266,666	0
5070	Insurance	92,055	24,302
5261	Shipping	83,231	15,606
5370	Communications	6,212	0
5373	Ship-to-Shore Communications	9,868	2,038
5550	Services	11,147	0
5590	Computing Services	2,745	0
5931	Equipment Rental	39,858	0
5981	Other Expenses – ODL	175,808	0
6820	Repairs & Maintenance	33,694	10,924
7040	Day Rates	2,924,254	348,240
7090	Port Calls	158,694	0
8400	Equipment	20,944	2,038
	Logging Operations	0	63,026
	Sub Total	**5,633,260**	**519,138**
	Logging Deployment SOE *		298,000
	Grand Total	**$5,633,260**	**$817,138**

* Mini-leg deployment. ADN, RAB

Leg 197	**Hawaiian Hotspot & Emperor Seamounts**
Proposal	**523-Full**
Title	**Motion of the Hawaiian Hotspot During Formation of the Emperor Seamounts: a Paleomagnetic Test**
Proponents	**J.A. Tarduno, R.D. Cottrell and B. Steinberger**

Assuming a fixed-hotspot frame of reference, the bend in the Hawaiian-Emperor chain has often been cited as the best example of a change in plate motion. Alternatively, the bend might be a record of the motion of the Hawaiian hotspot relative to the Pacific lithosphere. Four lines of inquiry support the latter view: 1) global plate motions predicted using relative plate motion data; 2) spreading rate data from the North Pacific basin; 3) mantle flow modeling utilizing geoid and seismic tomographic constraints; and 4) new paleomagnetic data from the Emperor chain. The best available paleomagnetic data suggest that Pacific hotspots may have moved at rates comparable to those of lithospheric plates in Late Cretaceous to early Tertiary times (81-43 Ma). If correct, this requires a major change in how mantle dynamics and the history of plate motions are viewed.

Leg 197 will test the hypothesis of southward motion of the Hawaiian hotspot by drilling five seamounts of the Emperor trend. The principal objectives are to obtain moderate penetrations of the basement (150-250 m) to obtain samples suitable for radiometric age and paleomagnetic paleolatitude determinations. A comparison of these dated paleolatitude values versus fixed- and moving-hotspot predictions form the basis of the proposed test. This sampling strategy will also allow us to address important geomagnetic questions which require paleomagnetic data from the Pacific plate, including the history of the time-average field and its paleointensity. The data will place fundamental constraints on the Late Cretaceous to early Tertiary motion of the Pacific plate. An improved picture of this motion history is needed if proxy climatic data from previous and future drill sites are to be used to define past latitudinal gradients.

Drilling Plan

Leg 197 will be drilling five seamounts in the Emperor chain in 1300-3200 m water depth. No sediment cores are planned because of time limitations; therefore, the holes would be RCB cored 150 m into basement with total penetrations of 1150, 950, 190, 210, and 230 mbsf. The estimated cored interval is 2730 with a recovery of 1563 m. The strategy is to obtain moderate penetrations of the basement (150-250 m) to obtain samples suitable for radiometric age and paleomagnetic paleolatitude determinations.

Logging Plan

Logging is given a high priority for the objectives of this cruise, with the log data being used primarily for core orientation and to determine formation dip/attitude of flow units or tectonic tilting. High relevance is given to the FMS for fracture identification and match to core structures. The GPIT and/or a 3rd party magnetometer will be used to collect magnetic data.

The resistivity tool has been the most valuable for the identification of single lava flows in the upper oceanic crust as well as in subaerial flood basalts. The typical resistivity signature

of single lava flows is mostly accompanied by corresponding devices in the density, neutron and velocity logs. It can be assumed that resistivity of the basement rocks is rather high and will likely exceed 2000 ohm-m, so the DLL will be available to collect reliable resistivity data.

The water depths at the proposed sites vary between 1300 - 3000 m with proposed penetrations between 40-1000 m of sediments (mostly silty clays, volcanic ashes, claystones) at each hole and about 150 to 250 m basement rocks (basalt flows). Deployments of the two standard toolstrings (Triple-Combo/FMS-Sonic) are planned. If a 3rd party magnetometer is deployed, an additional logging run will be required.

Table PP-13: Leg 197 Drill Site Locations

Site Name	Latitude (°N)	Longitude (°E)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
HE-1A	53°00.57'	164°42.81'	3000	1000	150	1150
HE-1B	52°53'	164°35'	3000	800	150	950
HE-2	50°24'	167°34'	3200	800	150	950
HE-3	51°11.9'	167°46.1'	2400	840	150	990
HE-4A	41°20.03'	170°22.74'	1300	42	150	192
HE-4B	41°30'	170°39'	1300	40	150	190
HE-5A	37°59.29'	170°35.86'	1480	60	150	210
HE-5B	38°12'	171°01'	1480	60	150	210
HE-6A	34°58.94'	172°08.98'	1331	80	150	230
HE-6B	34°54.32'	171°33.67'	1454	80	150	230

Figure PP-11: Leg 197 Drill Site Locations

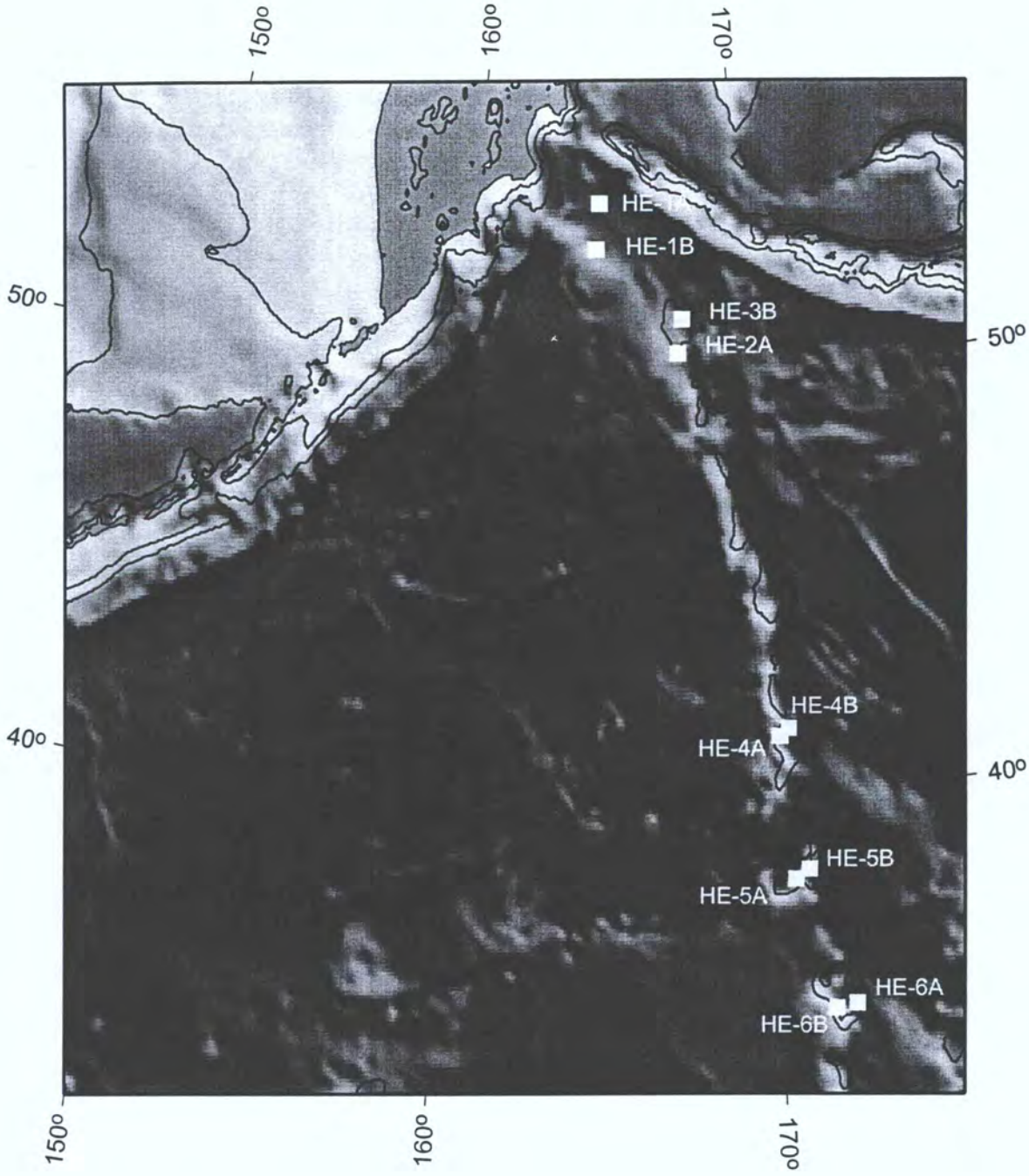


Table PP-14: Leg 197 Budget

Expense Category	Description	TAMU	LDEO
2000	Payroll/Salary	549,307	34,197
3500	Travel	12,007	6,630
3533	Drilling Clearances	0	0
3580	Travel to/from Port	77,772	8,064
3600	Training	10,266	0
3750	Travel - ODL	163,494	0
3760	Per Diem	69,359	1,808
4000	Supplies	159,898	3,481
4750	Fuel	266,666	0
5070	Insurance	93,589	22,277
5261	Shipping	67,290	14,306
5370	Communications	6,297	0
5373	Ship-to-Shore Communications	10,523	1,888
5550	Services	11,259	0
5590	Computing Services	2,791	0
5931	Equipment Rental	87,633	0
5981	Other Expenses – ODL	178,738	0
6820	Repairs & Maintenance	33,259	10,014
7040	Day Rates	2,970,512	319,220
7090	Port Calls	168,648	0
8400	Equipment	20,693	1,868
	Logging Operations		74,730
	Sub Total	**4,960,001**	**498,483**
	Logging Deployment SOE *		10,000
	Grand Total	**$4,960,001**	**508,483**

* DLL

Leg 198	**Paleogene Equatorial Pacific Transect**
Proposal	**486**
Title	**Paleogene Equatorial Pacific Transect**
Proponents	**M. Lyle, D.K. Rea, T.C. Moore and L.D. Stott**

The complex system of equatorial currents is one of the most persistent and clear traces of wind-driven circulation in the oceans. The unequal hemispheric thermal gradients in the modern oceans have pushed the Inter-tropical Convergence Zone (ITCZ) north of the equator and given rise to a narrow band of equatorial upwelling. This zone of upwelling and high productivity results in a high flux of biogenic debris within 1.5°–2° of the geographic equator, with peak values restricted to an even narrower zone. In the Pacific Ocean the rain of this debris has built, over geologic time, a mound of almost pure calcareous and siliceous sediments stretching along the equatorial region and reaching a thickness of over 500 m.

The central equatorial Pacific is unique among the world's oceans in that the path of plate motions carries this linear trace of equatorial upwelling and productivity northward with time. There are two clear impacts of this northward plate motion: (1) the thickest part of the equatorial mound of biogenic sediment is displaced several degrees to the north of the equator and (2) sediments deposited a few tens of millions of years ago have moved completely out of the region of high sediment flux. This movement into regions of very low sediment accumulation (or even erosion) puts Paleogene equatorial sediments within the reach of the Ocean Drilling Program's APC/XCB technology. For the most part the sediments have never been subject to strong burial diagenesis and can be cored easily with little disturbance. Time intervals notorious for extensive chert formation (e.g. the middle Eocene) are more likely to contain only oozes because they have never been buried deeply.

Over the last decade APC/XCB technology has been used to recover continuous Neogene sediment sections from the equatorial Pacific and to trace the variations in equatorial upwelling and biogenic flux during the transition from a one-pole ice age to a two-pole ice age. They have revealed intervals of very high flux rates linked with oceanographic and climatic change. The completely recovered Neogene sections have also been used to integrate biostratigraphy and paleomagnetic stratigraphy and have permitted the establishment of an orbitally tuned time scale back to 14 Ma. Leg 198 will take this coring technology back to the early Paleogene section, the time of the "hot house world."

Leg 198 will collect a transect of Paleogene sediments in the eastern Pacific Ocean. The transect is to be centered on the approximate positions of the equator at 50-60 Ma and at 35-40 Ma. The main objective of the drilling will be a detailed investigation of the oceanographic consequences of the long term cooling since the beginning of the Eocene. Three related questions will also be addressed by this transect: 1) what has been the long-term history of the intensity of atmospheric circulation; 2) what has been the latitudinal movement of the intertropical convergence zone (ITCZ) — a key indicator of the relative temperature gradients in the northern and southern hemispheres; and 3) what has been the history of hydrothermal activity during the Eocene and how might it relate to either warm climates or chert formation? From earlier DSDP rotary coring it is predicted that many of the planned drill sites should have a hiatus or a radiolarian ooze/red clay interval from the Holocene until about the middle Miocene. Below the carbonate-poor interval, there will be lower Neogene and Paleogene calcareous oozes that will permit detailed reconstructions of Eocene sea surface temperature (SST) gradients and equatorial circulation and productivity. Northern sites in the proposed transect may contain only clays above the calcareous lower

Eocene sediments. These sections are critical to mapping the movement of the ITCZ through time and to relating the extremely warm interval of the early Eocene to the history of hydrothermal activity. The southern sites are critical to mapping circulation changes during the rapid Eocene - Oligocene transition in calcareous sections.

Drilling Plan

Leg 198 will collect a transect of Paleogene sediments in the eastern Pacific Ocean. The transect is to be centered on the approximate positions of the equator at 50-60 Ma and at 35-40 Ma. The plan is to triple APC core 11 sites in water depths from 4817 to 5291 m, with one hole XCB cored to total depth at five sites. The MDCB system would be used to core 5 m into basaltic basement at all sites (55 m total). Six sites would be logged. The estimated cored interval is 5908 m with 5760 m recovery. Heavy use of the XCB and MDCB systems is anticipated, and chert is a potential problem.

Logging Plan

The main use of the standard toolstrings will be for the precise depth matching of cored sections, the characterization of in-situ physical properties, and the interpretation of lithology where core recovery is poor. Downhole measurements, in particular taken by the FMS and the new 3rd party high-resolution (~ 8 cm) gamma tool (if available), will also be useful for cyclostratigraphic analysis of continuous Paleogene sequences. Standard logs will also be invaluable for determining the position of chert layers, which are likely to occur in the lower part of the boreholes and will be difficult to recover in the core. Chert horizons show up exceptionally well as resistive bands on FMS images.

Logs will be to delineate the stratigraphic position of the chert layers, and for precise depth matching of cored sections. The logs should also provide proxies for lithology and for characterization of in-situ physical properties. High-resolution resistivity measurements with the FMS tool may be useful for the quantification of sedimentary cycles. Chert layers are more likely to occur in the lower part of the boreholes, therefore within the reach of most logging tools - FMS images should pick out the resistive chert bands quite well.

Table PP-15: Leg 198 Drill Site Locations

Site Name	Latitude	Longitude (°W)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
PAT-1	12°30'S	134°55'	4540	90	0	90
PAT-2	6°47'S	136°00'	4310	100	0	100
PAT-3	3°20'S	137°12'	4470	210	0	210
PAT-4	1°15'S	137°40'	4230	290	0	290
PAT-5	1°20'N	139°00'	4300	440	0	440
PAT-6	4°55'N	140°00'	4390	430	0	430
PAT-7	7°09'N	137°45'	4730	280	0	280
PAT-8	8°30'N	137°20'	4800	250	0	250
PAT-11	13°30'N	138°10'	4720	200	0	200
PAT-13	19°48'N	139°54'	5337	130	0	130
PAT-14	22°30'N	140°00'	5000	100	0	100
Site Name	Latitude	Longitude	Water	Sediment	Basement	Total

		(°W)	Depth (m)	(m)	(m)	mbsf (m)
PAT-16	36°00'	141°00'	5100	60	0	60
PAT-5A	00°30'N	138°54'	4400	0	410	410
PAT-6A	4°50'N	140°20'	4480	0	420	420
PAT-9A	9°30'N	140°30'	4950	100	5	105
PAT-10A	11°00'N	142°00'	5050	100	5	105
PAT-12B	13°53'N	142°43'	5100	90	5	95
PAT-13A	16°00'N	140°00'	5400	5	95	100
PAT-15A	25°55'N	147°31'	5200	70	5	75
PAT-16	36°00'N	141°00'	5100	60	5	65
PAT-17	7°00'N	139°30'	5020	200	5	205
PAT-18	13°00'N	142°30'	4950	150	5	155

Figure PP-12: Leg 198 Drill Site Locations

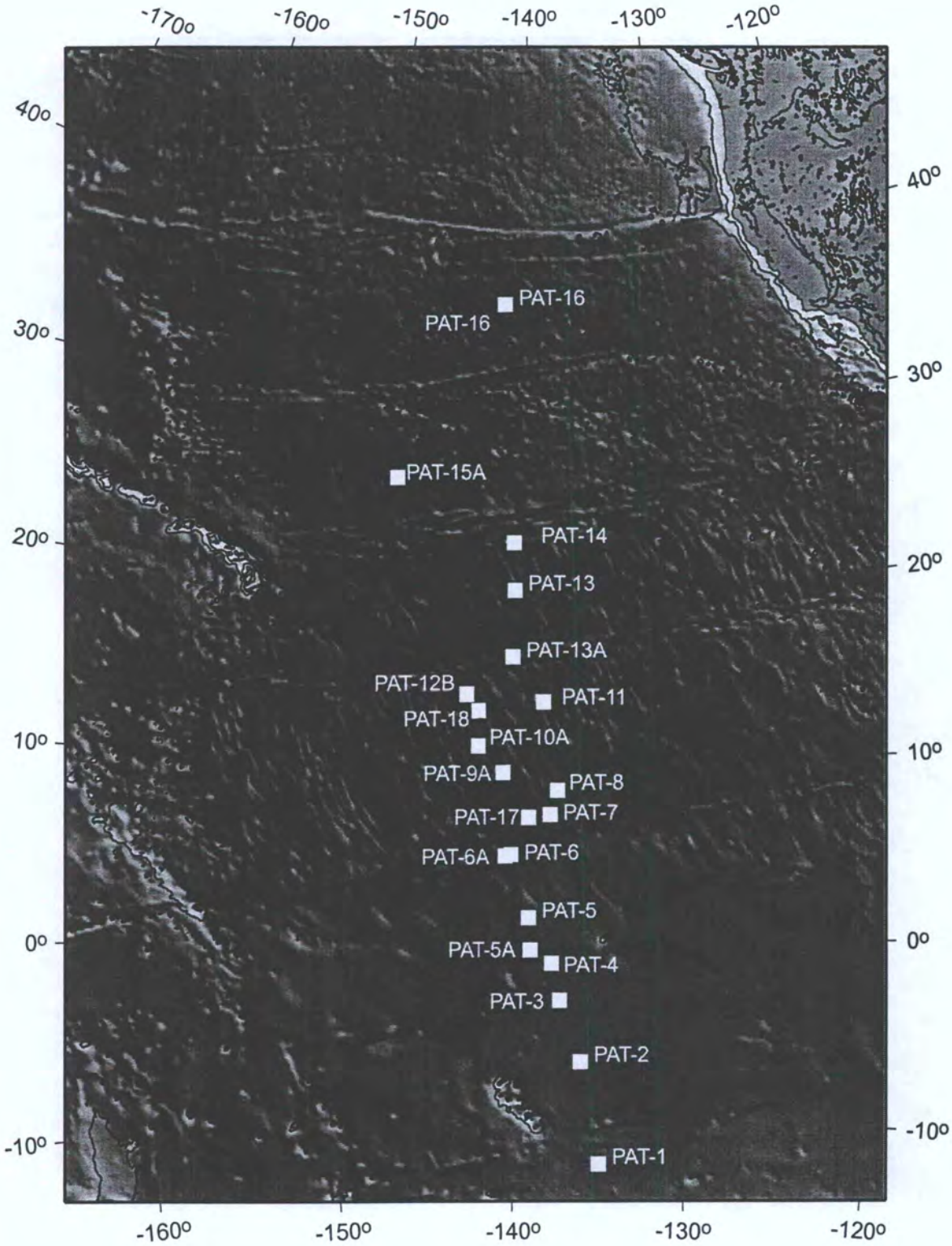


Table PP-16: Leg 198 Budget

Expense Category	Description	TAMU	LDEO
2000	Payroll/Salary	497,455	38,015
3500	Travel	10,236	7,233
3533	Drilling Clearances	4,840	0
3580	Travel to/from Port	54,186	7,152
3600	Training	9,826	0
3750	Travel - ODL	188,896	0
3760	Per Diem	59,270	1,973
4000	Supplies	243,670	3,797
4750	Fuel	266,666	0
5070	Insurance	79,781	24,302
5261	Shipping	59,064	17,414
5370	Communications	5,533	0
5373	Ship-to-Shore Communications	9,370	2,038
5550	Services	11,848	0
5590	Computing Services	2,379	0
5931	Equipment Rental	18,933	0
5981	Other Expenses – ODL	152,367	0
6820	Repairs & Maintenance	33,528	10,924
7040	Day Rates	2,610,959	348,240
7090	Port Calls	159,828	0
8400	Equipment	20,688	2,038
	Logging Operations		69,622
	Sub Total	**4,499,323**	**532,748**
	Logging Deployment SOE		0
	Grand Total	**$4,499,323**	**$532,748**

Leg 199	**Hydrate Ridge**
Proposal	**546-Full**
Title	**Drilling Hydrates on Hydrate Ridge, Offshore Oregon**
Proponents	**A. Trehu, M. Torres, S. Giovannoni, C. Goldfinger, E. Suess, K. Brown, M. Kastner, N. Bangs and D. Hammond**

Gas hydrates in sediments are a matter of considerable interest because of their potential as seals over hydrocarbon reservoirs, their significance as a possible resource, their role in slope stability and their potential for causing catastrophic changes in atmospheric methane and climate change.

Seismic data across Hydrate Ridge, off Oregon, show systematic variations in stratigraphic and reflectivity of the Bottom Simulating Reflectors (BSRs) that appear to be indicative of the impact of tectonic activity on the evolution of the hydrate/gas system of the Oregon margin. These patterns are especially well defined on the southern part of Hydrate Ridge, where grab sampling in 1996 revealed the presence of massive hydrate deposits near the seafloor.

Leg 198 will drill three holes, 400-700 m in depth, accompanied by comprehensive biological and geochemical sampling and by a suite of in situ measurements, to address the following specific objectives:

(1) Compare the source region for gas and the physical and chemical mechanisms of hydrate formation in two distinctly different sedimentary and tectonic environments: (a) the older sediments of the accretionary complex, where massive hydrates and associated authigenic carbonate are found near the seafloor and methane may originate in underthrust sediments, and (b) the younger, well-stratified sediments of the adjacent, rapidly-filling slope basin, where seismic reflectivity indicates deeply buried hydrate and/or free gas but no significant hydrate and/or carbonate accumulations near the seafloor. Here the gas source is likely to be more local.

(2) Calibrate estimates of hydrate volumes and underlying free gas content determined with geophysical remote sensing techniques. A better understanding of these properties is needed to map hydrate distribution regionally between drill sites, permitting us to evaluate the future economic potential of gas hydrates in subduction zone environments.

(3) Test, using geochemical tracers, physical properties measurements, and microstructural analysis, whether variations in BSR and subBSR reflectivity observed in seismic data result from tectonically induced hydrate destabilization, as inferred from seismic reflection data.

(4) Develop an understanding of the geochemical effects of hydrate formation in order to identify paleo-proxies for methane release that can be used to integrate the geologic data into climate models and understand the possible role of massive, catastrophic hydrate destabilization on global change.

(5) Determine the porosity and shear strength of hydrated and underlying sediments in order to evaluate the relationship between hydrates, fluid flow and slope stability.

(6) Quantify the distribution of methanogenic and methanotrophic bacteria in the sediments in order to evaluate their contribution to hydrate formation and destruction and related sediment diagenesis.

Drilling Plan

The plan is to core three sites for hydrates with 600-700 m penetration in 900-1220 m water depth. The holes would be APC/XCB cored to refusal and a fourth hole would be RCB cored to TD. An Offset VSP would be run with another ship, and LWD logs are specified for all three sites. Heavy use of the Adara, PCS, HYACE, WST, MDCB, and DVTP tools are probable. The estimated cored interval is 5560 with a recovery of 3485 m. Reentry Cone installations with 70 m of 16 in and 600-700 m of 10-3/4 in casing are proposed for two sites.

Logging Plan

To be provided in the FY 02 Program Plan

Table PP-17: Leg 199 Drill Site Locations

Site Name	Latitude (°N)	Longitude (°W)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
HR-1A	44°35.2'	125°07.0'	900	700	0	700
HR-2A	44°35.15'	125°03.85'	1220	600	0	600
HR-3A	44°35.25'	125°09.95'	1000	600	0	600

Figure PP- 13: Leg 199 Drill Site Locations

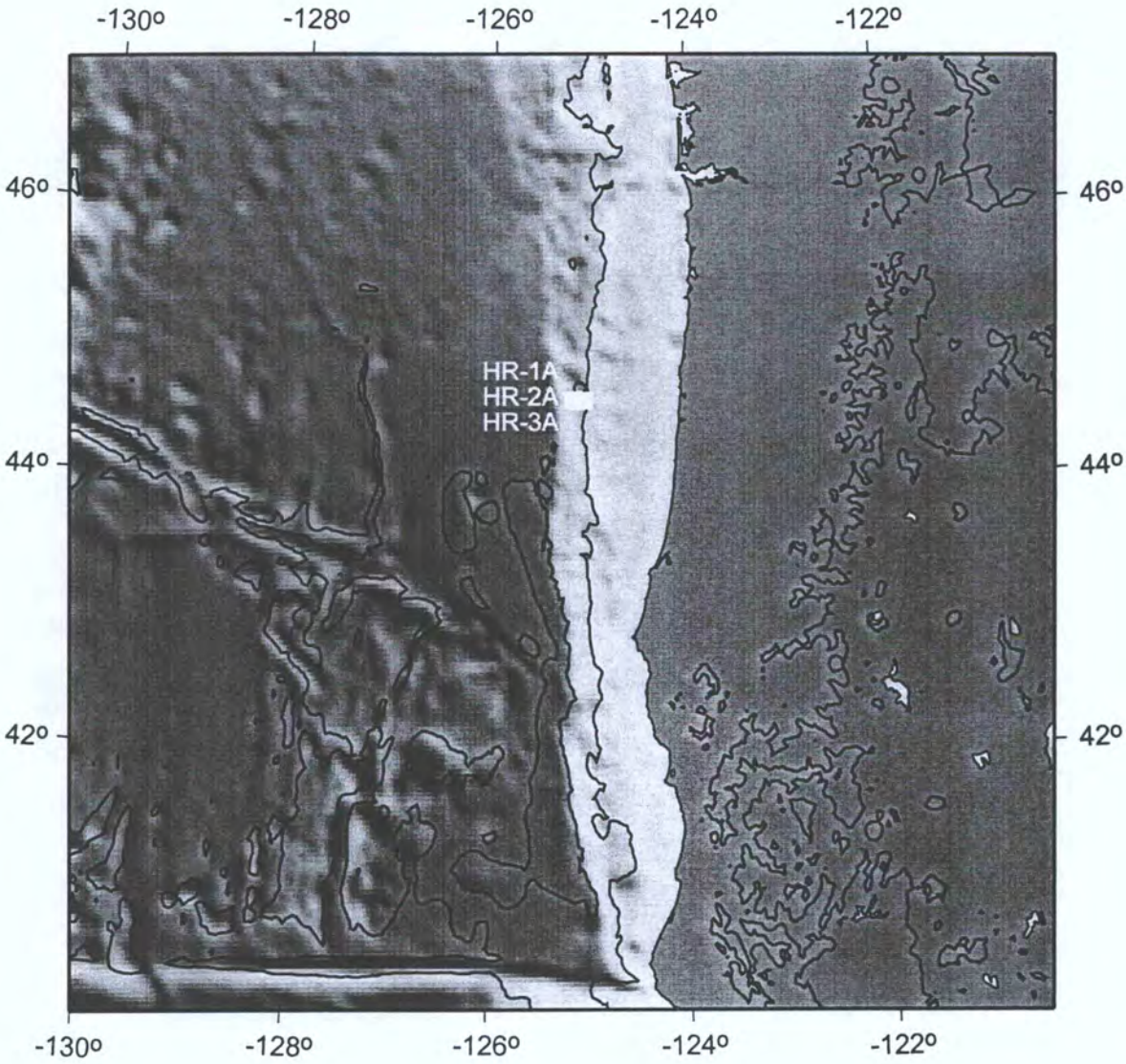


Table: PP 18: Leg 199 Budget

Expense Category	Description	TAMU	LDEO *
2000	Payroll/Salary	167,629	0
3500	Travel	0	0
3533	Drilling Clearances	0	0
3580	Travel to/from Port	52,977	0
3600	Training	109	0
3750	Travel - ODL	23,089	0
3760	Per Diem	0	0
4000	Supplies	237,072	0
4750	Fuel	0	0
5070	Insurance	0	0
5261	Shipping	60,519	0
5370	Communications	0	0
5373	Ship-to-Shore Communications	833	0
5550	Services	4,407	0
5590	Computing Services	0	0
5931	Equipment Rental	18,933	0
5981	Other Expenses – ODL	0	0
6820	Repairs & Maintenance	12,543	0
7040	Day Rates	1,522,232	0
7090	Port Calls	100,017	0
8400	Equipment	1,951	0
	Logging Operations	0	0
	Sub Total	**2,202,311**	**0**
	Logging Deployment SOE *		0
	Grand Total	**$2,202,311**	**0**

* To be provided in the FY 02 Program Plan

Glossary of Expense Categories

TAMU

Payroll—This category contains salary, fringe and sea pay directly associated with specific legs, along with pro rata amounts of the same items for employee efforts in support of leg activities.

Travel—Travel in support of leg activities (e.g., postcruise travel), exclusive of port call travel, are contained in this expense category.

Travel to/from Port Call—Funds in this category support travel to and from the ship at port calls for all seagoing personnel and other Program employees attending port call. All funds are leg specific.

Training—This category contains funds that support training of the shipboard staff and other Program employees who receive specific training (e.g., Labview, Novell, etc.) that supports shipboard activities. The costs are both leg specific and pro rata.

Travel—ODL funds are budgeted for rotation of the ODL, SOS and Catermar staff for each leg. The amounts depicted for each leg are leg specific.

Per Diem—This category reflects catering charges for 45 personnel per month based on the most recent averages of shipboard participants. This category does not include ODL, SOS or Catermar personnel, as they are accounted for in the day rate.

Supplies—In this category are leg specific supplies (e.g., drilling supplies, laboratory supplies, core liners, etc.), safety equipment for the ship and personnel and departmental pro rata expenses associated with the annual cost of supporting the science plan at sea.

Fuel—Fuel is budgeted for seven refuelings (8000 metric tons) at an average cost of $220 per metric ton. Each leg is budgeted at 1,143 metric tons.

Insurance (Ship Ops-ODL/ODP)—Funds in these categories are to reimburse ODL for Hull & Machinery and Removal of Wreck coverage and the ODP/TAMRF Marine Package insurance (refer to Appendix III).

Shipping—The majority of costs contained in this category are leg-specific costs and involve shipment of equipment and supplies to and from the ship. There is a small amount of funds associated with shipment/mailing of items in support of leg activities throughout the year.

Communications—This expense is associated with shore-based cost incurred in support of leg activities. Some costs are leg specific, while others are incurred in support of multiple legs.

Ship-to-Shore Communications—Satellite communications and regular communications charges between the *JOIDES Resolution* and shore-based personnel are included in this category.

Services—In this category are cost associated with temporary employees hired through companies/corporations, drill pipe maintenance, wireline severing charges, shipboard maintenance service calls, and physical examinations for seagoing personnel.

TAMU Computing Services—The pro rata cost associated with computing services reimbursed to TAMU in support of ship operations is included in this expense category.

Equipment Rental—Rental of third party drilling equipment (e.g., underreamers, drilling jars, etc.) makes up this category.

Other Expenses-ODL—In these expense categories (1806-01/1806-02) the annual payment of $1,000,000 to ODL (1806-01), the cost of medical evacuation (1806-02) and operation of the waste management system (1806-02) are covered by these funds.

Repairs & Maintenance—Funds contained in this category are for repairing drilling, coring, operations, and laboratory equipment for the ship.

Day Rates—Covers the cost of staffing the ship to include the sailing crew, drilling personnel, and catering personnel. It does not cover the cost of ODP/TAMU's crew or the scientists on board the ship. The day rate varies according to the mode of the ship which is generally operating, standby, or cruising. While it is a fixed rate per day, the day rate is adjusted for changes in the Consumer Price Index-Urban (CPI-U) and Employment Cost Index (ECI). When the cumulative change in the CPI-U and ECI (since the last increase) equals or exceeds 2%, the day rates will be adjusted by the percentage change. The adjustment takes effect at the beginning of the month following the increase and cannot occur more frequently than every six months.

Port Calls—Locations have a definite effect on the cost of port calls which covers agents' expenses and freight associated with resupplying the ship. During each port call, cores and equipment are off-loaded from the previous cruise and supplies are loaded for the upcoming leg. ODL is reimbursed for port agent charges and the shipment of food and related supplies. Shipment of cores, drilling equipment, and laboratory supplies is arranged and paid by ODP/TAMU and paid for by ODP/ TAMRF. Similarly, ODP/TAMRF purchases all drilling equipment and laboratory supplies necessary for meeting the objectives of the leg. These costs are covered in other areas, not Ship Operations.

Equipment—Includes costs associated directly with equipment (computer, scientific, and drilling) intended solely for use on the ship over a period of time greater than one leg, equipment purchased for a specific leg and pro rata cost of shore-based equipment used partially to support leg activities.

LDEO

Salary—Leg-based salaries include fringe and sea pay for logging scientists during the cruise. Salaries for pre- and post-cruise work are not included. Salaries for shorebased processing and other technical support are also not included.

Travel to/from Port Call—Travel of sea-going personnel to and from the drillship. It does not cover portcall travel for technical or management personnel or the pre- and post-cruise travel associated with the cruise (e.g., pre-cruise meetings).

Travel—Schlumberger funds are budgeted for rotation of the logging engineers for each cruise and for port call maintenance travel by Schlumberger technicians. Travel funds are also reflect prorated travel costs for the mechanic that is shared by ODL, TAMU, and the logging program.

Per Diem—This category reflects prorated catering charges for the mechanic that is shared by ODL, TAMU, and the logging program.

Supplies—The cost of replenishing supplies for the Downhole Measurements Lab and for upgrades/additions to the software for this lab.

Insurance—Insurance for standard logging tools during below-the-keel deployments.

Shipping—The costs for routine shipments to and from the ship.

Ship-to-Shore Communications—The costs for phone and fax communication to the ship, as well as satellite transmission of data.

Repairs and Maintenance—Upgrade, modifications, and repair of non-Schlumberger tools and data acquisition systems.

Day Rates—Covers the costs associated with the leasing of standard tools and the associated engineering support services.

Equipment—Prorated costs of computer, scientific, and engineering equipment for use on the ship over a period of time greater than one leg.

Other Expenses – Logging—Covers computer service charges and indirect costs associated with leg operations.

Logging Operations - SOE—Covers the leasing, shipping, and insurance expenses associated with the deployment of special tools.

Budget Overview

The Program Plan budget successfully meets the FY01 target of $46.1 M provided by the US National Science Foundation (Table ES-2). The budget is designed to meet the highest priority science and engineering needs identified by the JOIDES advisory structure. Once the needs are identified, the budgeting process begins by determining the leg-based scientific and operational requirements, including the costs of ship operation, drilling and down-hole operations, logging science, and laboratory needs, among others. Consistent with the Program-wide move towards project-based management, and identification of research legs as "projects", the majority (greater than 75%) of the science and logging operational budgets have been allocated to, and apportioned within, leg-based budgets. Detailed budgets, for Legs 192 through 199, are presented in the "Program Plan" section. Note that although Leg 199 is scheduled to sail in the next fiscal year (FY02), a portion of the science operator's costs for this leg will be incurred in FY01, and are thus budgeted therein.

The second step in the budgeting process, which is taken to maintain scientific innovation in the Program, is allocation of approximately $2.1M (~$800K more than in FY00) for science and engineering needs of the highest caliber. These are referred to as "special operating expenses" (SOEs). Nearly $1.17M has been budgeted to provide the capability for long term *in-situ* monitoring of geological processes in the Nankai Trough region, off Japan, during Leg 196. This scientific initiative, highlighted in the 1996 ODP Long Range Plan, will enable scientists to establish multiple, isolated zones within the drill hole for hydrogeological investigation, monitoring, and characterization of the processes that epitomize the dynamics of a convergent margin. About $870K will be used by the science operator for Advanced CORKS and affiliated hardware. The remaining $300K will be used for logging-while-drilling in Nankai's accretionary prism, where the challenging environment will likely preclude high recovery of cores and standard logging operations.

The science operator's budget also includes an additional $500K for other leg-based SOE expenses, such as for special drill bits, casing equipment, re-entry cones, and extra liners for high recovery legs. An engineering development project, described in the "Program Plan" section, and named "Downhole Measurements Technology", has been budgeted at $170K. This project will enable centralized support for tools that are used to determine formation temperature, and to sample water and gas hydrates *in situ*, among other things. A Service Center will be established to provide centralized documentation control, inventory control, technical support, and orderly implementation of upgrades and changes.

Logging SOEs include an additional $212K for specialty logging tools on three legs, and $50K for a joint pilot project with the Site Survey Data Bank (SSDB) that will enable ODP scientists to integrate and manipulate seismic survey data with log and core data on a computer workstation on the drillship and at the SSDB.

The third step in the budget process is assessing Program needs that are not directly affiliated with legs, such as services in science, technical support, operations, publications, information, management, administration, logging, JOIDES advisory, public affairs, and technical and engineering development projects. These funds, together with associated leg-based funds are incorporated into the department-based budgets presented in Table ES-2.

In FY01, the Program will see no increase in funding above the FY00 level. Standard increases in fixed costs (such as *JOIDES Resolution* leasing expenses) and in inflation, reduce the Program's base budget for scientific research. As explained in the FY98, 99, and 00 Program Plans, the ODP contractor and subcontractors have adapted to a flat, or near flat funding scenario by implementing a series of steps to optimize program delivery and cost

effectiveness. This year, in addition to these measures, the Program managers intend to deliver the highest priority JOIDES science by assuming additional risk, by not filling positions that were identified for new projects, and by cutting lower priority science that would be accomplished if funds were available.

Two examples of risk are highlighted. The FY01 plan budgets ship fuel at its historical average of $200/metric ton whereas current (May 2000) prices are approximately $300/ton. The assumption, and thus the inherent risk, is that fuel prices will return to historic averages. Second, normally scheduled refurbishment of drill pipe will not be conducted in FY01. This will result in degradation of the drill pipe and will increase the possibility of pipe loss during subsequent drilling operations.

In an attempt to offset flat funding, the Program has sought funds from external sources and will continue to do so. In FY00, over $500K of funds or equipment contributions-in-kind were provided by the US Department of Energy (for the purchase of an ICP-AES for the shipboard chemistry lab), by US scientists (in the form of lab equipment for the new microbiology lab, funded under the NSF "Life in Extreme Environments" initiative), and from JAMSTEC (to TAMU for the development of the Advanced Diamond Core Barrel). In FY01, the Program will realize ~$80K of cost savings through a new Schlumberger/GeoQuest university software license program. ODP has not seen a substantive increase in funding from existing or new partners in more than seven years. The increase in contributions by new partners has been more than offset by the decrease in contributions by others.

Table PP-19 summarizes the FY01 budget and compares it to the approved FY00 and 99 budgets. The ODP budget is divided into three major categories: Science Operations (TAMU), Logging Services (LDEO), and Prime Contractor (JOI/JOIDES) Services budget includes the LDEO Borehole Research Group, international processing centers, and the subcontractor (Schlumberger Offshore Services). The Prime Contractor (JOI/JOIDES) includes program management at JOI, advisory services of the JOIDES Office, the ODP Site Survey Data Bank at LDEO, and miscellaneous costs such as printing and distribution of the JOIDES Journal and providing Panel Chair Support.

Table ES-3 lists the Special Operating Expenses. Additional details are provided in the program plan section of this document and in the TAMU and LDEO appendices.

Table PP-19: Budgets for FY 99 - FY 01 ($K)

TAMU	FY 99	FY 00	FY01
Science Services	4,218	4,388	4,373
Drilling Services	5,220	5,039	4,181
Information Services	2,222	2,411	2,473
Publications	1,665	1,756	1,776
Headquarters/Administration	2,061	1,854	1,960
Ship Operations	26,194 *	23,592	23,787
TOTAL TAMU	**41,580**	**39,040**	**38,550**
LDEO	**4,936**	**5,044**	**5,273**
JOI/JOIDES	**1,984**	**2,016**	**2,277**
GRAND TOTAL ODP BUDGET	**48,500**	**46,100**	**46,100**

* As in FY 98, NSF provided $3 M in FY 99 to cover obligations (totaling $6 M) associated with the drillship mid-life refit.

Table PP-20: FTE Comparisons for FY 99 - FY 01

	FY 99	FY00	FY01
TAMU			
Headquarters/Administration	30.47	28.42	27.20
Publications	24.00	24.00	25.00
Drilling and Engineering	20.50	21.50	19.50
Science Services	48.00	47.00	52.00
Information Services	25.00	25.50	25.50
Total	**147.97**	**146.42**	**149.20**
LDEO			
Borehole Research Group	11.58	11.58	11.58
NEB-LMF	2.45	2.45	2.45
University of Leicester	2.16	2.05	2.05
University of Aachen	.42	.42	.50
Ocean Research Institute	.33	.34	.50
Total	**16.94**	**16.84**	**17.08**
JOI/JOIDES			
JOI Direct	7.37	7.66	7.49
JOIDES Office (RSMAS)	2.75	2.75	2.75
ODP Data Bank	3.25	3.25	3.75
Total	**13.37**	**13.66**	**13.99**
Total	**176.28**	**176.92**	**180.27**

TAMU Projects

ADVANCED CORK (A-CORK)

Purpose: To establish multiple isolated zones for long term monitoring in the Nankai Trough region (Leg 196). This will be accomplished by emplacing multiple casing packers in the formation. The packers will be used to straddle, and thus isolate, individual zones of interest. A plenum, created by a modified oil field gravel pack screen, will be placed within each zone of interest. Sampling tubes will lead from the plenum within each zone of interest to the seafloor, where various sampling and monitoring instruments can be attached, removed, changed out, etc. The Advanced CORK will also be designed to be "drilled-in" unstable environments such as accretionary prisms.

Objectives: To provide long term in-situ monitoring of geological processes per the long range plan. To develop all necessary hardware and deployment procedures for emplacement of the Advanced CORK.

Schedule:

15 April 2000	Complete design and issue bid packages for fabrication of basic Advanced Cor hardware (head, running tool, tubing straightener, go-devils, packers, etc.)
15 May 2000	Issue purchase order for fabrication/purchase of basic Advanced CORK hardware
01 August 2000	Advanced CORK assembly and bench testing
01September 2000	Rework Advanced CORK assembly/design as required
15 September 2000	Final Advanced CORK bench testing
01 October 2000	Issue purchase order for ancillary Advanced CORK hardware (hydraulic tubing centralizers, strapping, etc.)
01 January 2000	Check Advanced CORK inventory/shipment for Leg 196
15 February 2000	Ship all Advanced CORK hardware for Leg 196
11 April 2000	Leg 196, Nankai II, begins

Costs: The Advanced CORK costs for Leg 196 are integral to the leg specific costs which are $867,177. The A-CORK completion equipment cost is estimated at $623,375.

Risks: There exists a moderate risk of damaging a portion of the Advanced CORK assembly during deployment. This is especially true when the Advanced CORK assembly is drilled into place. The risk further increases when the Advanced CORK is drilled into unstable environments such as accretionary prisms. Successful assembly and deployment of the Advanced CORK at sea will be dependent on weather, sea, and current, conditions prevailing at the time of deployment.

DOWNHOLE MEASUREMENT TECHNOLOGY

The purpose of this project is to provide centralized support for ODP/TAMU downhole measurement tools, as well as develop and acquire new measurement tools for improved science.

A major part of this effort is to create a commonality in data acquisition and support software for all downhole measurement tools. This will be applied to current operational tools, third party tools and future tools. A Service Center has been set up to provide centralized documentation control, inventory control, technical support, and orderly implementation of upgrades and changes. Initially, the five tools being included in this project are the APC Temperature tool, the WSTP, the DVTP, the APC Methane tool, and the Drilling Sensor Sub (DSS).

APC Temperature Tool and WSTP

The purpose of the project is to find alternative support for the APC Temperature tool and WSTP electronics since the original supplier, Adara Systems, has decided to discontinue support.

Blue Mountain Instruments repaired and calibrated two of the three APC Temperature tools. They are holding the third tool for testing the Y2K upgrades. Blue Mountain Instruments also has an order to compile and deliver to ODP all documentation, software source code and drawing files, which are held by ADARA Systems. The two APC Temperature tools were sent to the ship for Leg 188. Three more APC Temperature tools will be sent to Blue Mountain Instruments after the technology transfer package is delivered.

Project Summary Table

Subcontractor	Project	Task	Target or Completion Date	Comments
N/A	APC Temperature Tool	Negotiate Technology Transfer Procedures with Adara Systems	9 September 1999	
N/A	APC Temperature Tool	Receive Proposal from Blue Mountain Instruments (Glenn Jolly) to handle technology transfer	16 September 1999	Proposal also included quote for repair and calibration
Blue Mountain Instruments	APC Temperature Tool	Place order to repair and calibrate three APC-T electronics	2 November 1999	
Blue Mountain Instruments	APC Temperature Tool	Receive first repaired and calibrated electronics from Blue Mountain	22 December 1999	Shipped 2 to JR for Leg 188 port call
Blue Mountain Instruments	APC Temperature Tool	Issue contract for technology transfer	4 January 2000	
Blue Mountain Instruments	APC Temperature Tool	Receive technology transfer package at ODP	Target 7 April 2000	
N/A	APC	Upgrade software to Labview	Target November 2000	
N/A	APC	Upgrade manuals	Target December 2000	
N/a	APC	Integrate ODP DAS	Target March 2002	
	APC w/ODP DAS	Test on leg	Leg in May 2002	
	WSTP	Upgrade software to Labview	Target December 2000	
	WSTP	Upgrade manuals	Target July 2001	

	WSTP	Integrate ODP DAS	Target April 2003	
	WSTP	Test on leg	Leg in March 2003	

Davis/Villinger Temperature Probe (DVTP)

The purpose of the project is to adopt the Davis/Villinger Temperature Probe (DVTP) as an ODP operational tool.

All of the existing documentation has been collected and centralized in the DSD library. Seventy-five percent of the drawings, both mechanical and electrical, have been integrated into the ODP drawing system. The overall assembly and the electrical assembly drawings are 75% complete.

A design modification was completed on the interface between the electrical assembly and the pressure case bulkhead to facilitate integration of the pore pressure sensor. Parts were received and one of the tools was upgraded. The upgraded tool was sent to the ship for Leg 188.

ODP is working with Earl Davis to help integrate the pore pressure measurement into the DVTP tool. Bob Macdonald, the PGC engineer is scheduled to come to College Station in mid-April to assemble the prototype and train ODP technicians. The target for prototype deployment is Leg 190.

The following personnel worked on this project during the reporting period:

Derryl Schroeder, ODP Project Manager; Dean Ferrell, Electronic Technician; Eric Schulte, Documentation Control/Mechanical Designer; Bob MacDonald, PGC Engineer.

Project Summary Table

Subcontractor	Project	Task	Target or Completion Date	Comments
N/A	DVTP	DVTP #7270 Received from Earl Davis	2 June 1999	Was loaned to Earl Davis for work on adding pressure sensor
N/A	DVTP	DVTP Received from Ship	30 August 1999	DVTP returned to be modified
N/A	DVTP	Modify Electronics Chassis Mount for New Pressure Case	21 December 1999	For Future Pore Pressure Sensor
N/A	DVTP	Return one DVTP to Ship	8 January 2000	Leg 188
N/A	DVTP	Archive DVTP Firmware and Software	20 January 2000	
N/A	DVTP	Create Windows Front End for Tool Communications	26 January 2000	
N/A	DVTP	Complete DVTP Assy Drawing Package	1 May 2000	
N/A	DVTP	Upgrade to Labview	Target May 2000	
	DVTP	Update DVTP Manuals	Target August 2000	
	DVTP			
	DVTP-Pore	Deploy DVTP with pore pressure measurement	24 May 2000	Deployed Leg 190
	DVTP-Pore	Upgrade to Labview	Target June 2000	
	DVTP-Pore	Update DVTP Manuals	Target September 2000	

	DVTP-Pore	Fabricate 3 new tools	Target P.O. for Sept 2000	
	DVTP-Pore	Integrate ODP DAS	Target November 2002	
	DVTP-Pore	Test on leg	Leg in December 2002	

APC – Methane Tool (Temperature, Pressure, Conductivity)

The purpose of the project is to monitor the effects of gas loss in cores from the time the core is cut until it reaches the deck by recording temperature, pressure, and conductivity with sensors mounted in the APC piston. This will allow in situ concentrations of methane to be calculated.

The APC-Methane tool is being developed in concert with Charlie Paull and Bill Ussler of Monterey Bay Aquarium Research Institute (MBARI). The sensor development is being done at MBARI while the electronics and packaging is being done at ODP-TAMU. The ODP Downhole DAS, currently under development, will be packaged in the APC piston as the TPC Multi-Processor Unit (MPU).

The ODP-TAMU development schedule has been delayed due to Derryl Schroeder and Mike Friedrich's involvement with commissioning Rig Instrumentation System and Active Heave Compensator.

The following personnel worked on this project during the reporting period:

Derryl Schroeder, ODP Project Manager; Mike Friedrichs, Engineering Advisor; Bill Ussler, MBARI P roject Manager.

Project Summary Table

Subcontractor	Project	Task	Target or Completion Date	Comments
N/A	APC Methane tool	Joint Planning meeting between MBARI and ODP-TAMU	30 April 1999	Joint Project between MBARI and ODP-TAMU
N/A	APC Methane tool	Project Design Work Initiation	1 September 1999	
N/A	APC Methane tool	Sensor Modeling	26 November 1999	MBARI Task
N/A	APC Methane tool	First ROV Test with Sensors	1 February 2000	MBARI Task
N/A	Prototype APC Methane	APC Prototype Piston Design	Target November 2000	ODP-TAMU Task
N/A	APC Methane tool	ROV Test of Complete Mockup	15 November 2000	MBARI Task
N/A	Prototype APC Methane	Package MBARI Prototype electronics	Target August 2000	ODP-TAMU Task
N/A	Prototype APC Methane	Integrate Prototype Piston & electronics	Target December 2000	ODP- ODP-TAMU Task TAMU Task
N/A	Prototype APC Methane	Field Test	Deploy Leg 195	ODP-TAMU Task

	Prototype APC Methane	Labview upgrade	Target February 2001	ODP-TAMU Task
	ODP DAS	Design architecture complete	Target may 2001	ODP-TAMU Task
	ODP DAS	Build prototype DAS & Sensors	Target November 2001	ODP-TAMU Task
	ODP DAS	Release version of ODP DAS & sensors	Target January 2002	ODP-TAMU Task
	APC-methane w/ODP DAS	Deploy on ship	Target Leg 201	ODP-TAMU Task

Memory Drilling Sensor Sub (DSS)

The purpose of this project is to run a Memory Drilling Sensor Sub near the bit, which will improve the understanding of the dynamic forces at work downhole and quantify the impact of heave and surface inputs (torque, weight, rpm, flow rate) on bit performance.

An industry survey was taken to examine the current technology and to determine the level of interest by vendors to provide a custom sub for ODP. Two suppliers responded positively. This tool would be adapted to handle the 4-1/8 inch through-bore to allow for core retrieval.

The schedule has been delayed due to Derryl Schroeder's involvement with commissioning rig instrumentation.

A demonstration test of a commercial sensor sub was run using an Anadrill MWD system on Leg 188. Anadrill's MWD tool, the PowerPulse, had Weight-on-Bit and Torque-on-Bit sensors integrally built into it. The test successful demonstrated the practical application for the Memory Drilling Sensor Sub, especially when data is transmitted in real time.

The following personnel worked on this project during the reporting period:

Derryl Schroeder, Project Manager.

Project Summary Table

Subcontractor	Project	Task	Target or Completion Date	Comments
N/A	Downhole Sensor Sub	Complete Vendor Survey	30 June 1999	Vendors being considered: Ryan Energy, QDT (Allied Signal), Stress Engineering
N/A	Downhole Sensor Sub	Demo Commercial Sensor Sub	12 January – 12 March 2000	Leg 188 - Anadrill MWD
N/A	Downhole Sensor Sub	Vendors Receive Request for Proposal (RFP)	30 April 2000	
N/A	Downhole Sensor Sub	Bids Received	15 June 2000	
TBD	Prototype Memory DSS	Contract Awarded	July 2000	Estimated Cost = $55K
	Prototype DSS electronics	Procure and Package	Target November 2000	
TBD	Prototype Memory DSS	First Article on Land Rig Test	Oct 2000	
TBD	Prototype Memory DSS	Deploy on *JOIDES RESOLUTION*	Leg 195	
	DSS w/ ODP DAS	Integrate ODP DAS into prototype	Target Sept 2002	
	Retrievable Memory Module (RMM)	Build prototype	Target Nov 2002	
	DSS with RMM	Deploy on JR	Target November 2002	

Risk:

The schedule for development projects and tool upgrades has been impacted negatively by the shift of engineering resources to support the implementation of the Active Heave Compensator (AHC) and the Rig Instrumentation System (RIS). Both the Engineering Advisor and the Senior Engineer who are assigned to Downhole Measurements Technology are responsible for follow-up and ongoing support of AHC and RIS. The AHC and RIS engineers are also key to the development of the DAS, APC Methane tool, and the memory Drilling Sensor Sub. One Senior Electrical Design Technician and one Senior Mechanical Design Technician are currently available to provide less than full-time support to the two engineers. Two manpower slots, one for a Senior Electrical Design Technician and one for a Senior Mechanical Design Technician, remain unfilled and are on hold until FY02 due to budget constraints.

The effectiveness of the Service Center will depend on adequate staffing. The current makeup of the Service Center consist of one Senior Engineer, who is referred to above, and one Senior Electrical Design Technician, also referred to above. While they have been able to centralize documentation of the APC Temperature, WSTP and DVTP tools, there remains a significant amount of effort required to bring the individual tool manuals up to release standard. Quality manuals are critical for adequate training, as well as tracking tool modifications and procedures changes. The addition of new technologies such as Rig Instrumentation, APC Methane tool, DVTP with pore pressure, and the memory Drilling Sensor Sub will compound the need for a well-staffed Service Center.

LDEO Special Projects

IESX Joint Pilot Study (BRG and Databank)

Purpose:
The purpose of this project is to enhance ODP's capability for seismic-log-core integration by providing data packages in IESX format. Evaluation of the procedures and level of effort that would be needed for routine digital data access, while enabling some protected release of site survey data, is the long-term objective.

Background:
In January 1999, the following recommendations were made by SciMP:

SCIMP RECOMMENDATION 99-1-11: SCIMP recognizes the importance of maximizing the integration between core, log, and seismic data both on the *JOIDES Resolution* and in post-cruise research. Presently, there are limited resources available on the *JOIDES Resolution* to integrate these datasets. To this end, SCIMP recommends that the Borehole Research Group enable the seismic and sonic analysis software presently installed as part of the GeoFrame system both on the *JOIDES Resolution* and at the BRG at Lamont.

SCIMP RECOMMENDATION 99-1-12: SCIMP recommends that BRG-LDEO should have as their baseline expertise the ability to do time-depth calibration (i.e., to tie depth data [core/log] to time data [seismic]). This capability should include the ability to integrate checkshot data with wireline sonic data and the ability to generate synthetic seismograms at sea.

Following the January 1999 SCIMP recommendation, BRG reviewed commercial seismic software packages that allow for better integration of digital seismic data for shipboard science and decided that IESX best meets the overall needs of the program.

At the January 2000 meeting, the following recommendations were made by SciMP:

SCIMP RECOMMENDATION 00-1-9: SCIMP recommends: 1) That shipboard facilities for Wireline/Seismic/core integration include a separate workstation dedicated to this effort 2) That the IESX software be able to plot directly to large-scale (36") plotters and printers and that this capability be implemented by June 2000 SciMP meeting. 3) That ODP-LDEO and ODP-TAMU provide a plan for integrating the Unix network on the ship.

SCIMP RECOMMENDATION 00-1-10: SCIMP recommends that LDEO develop a procedure for creating IESX project files for each ODP drill site that will include the digital seismic profiles so that these data can be visualized interactively with the log and core data during and after the drilling of each site. The project file should be the basis for the seismic/log/core integration and time-depth conversion capabilities defined in SCIMP recommendations 99-1-11 and 99-1-12.

SCIMP RECOMMENDATION 00-1-11: SCIMP recommends that LDEO also create a tutorial and training project file with seismic /log/core integration for the shipboard "cookbooks" so that technicians and scientists can improve their skills with IESX, GeoFrame, and the integration process while at sea. This training project and documentation should be available for SCIMP review by June 2000.

SCIMP RECOMMENDATION 00-1-12: SCIMP recommends that JOI modify the site-survey data requirements for seismic profiles in the Data Submission Guidelines (DSG).

Objectives:
The main tasks of this project involve acquiring and converting seismic survey data into IESX-compatible format for use prior to and during a leg. This approach will standardize deliverables to and from the SSDB and assist them with digital data management. The integrity of the digital data will be monitored and assured using a standardized format. Processed data and navigation output can be maintained in an on-line data catalog (similar to the on-line log catalog). Although the resources required to do this on a routine basis could be considerable. We anticipate that the IESX pilot study will allow the scope of the data handling requirements and resources to be evaluated and allow SSP and other JOIDES panels to consider the appropriate approach for seismic data handling in the future.

The main tasks associated with this project are:

- Acquire digital data from proponents
- Convert data into IESX-compatible format
- Deliver data package to ship as IESX project
- Use during cruise for operations and for seismic-log integration
- Evaluate integration of seismic data collected by *JOIDES Resolution*

Schedule:

Oct-Dec 2000- Preparation of data for Leg 194
Jan-March 2001- Leg 194 operations
Jan 2001 - SSP preliminary review of Leg 194 package
Jan 2001 - SciMP preliminary review of Leg 194 package
Jan-March 2001 - Preparation of data for Leg 196
April - June 2001 - Leg 196 operations
June 2001 - SciMP evaluation of pilot program
July 2001 - SSP evaluation of pilot program.
August 2001 - Presentation of results to SCICOM/OPCOM

Cost:
Efforts during FY 01 will focus on Marion Plateau and Nankai II, but other legs are possible as data are available and resources allow. The estimated cost of the project is $50,637. A detailed budget is presented in the next section.

Risk:
As the IESX software is a commercial product that has been used by industry for these purposes quite successfully, the technical risk is extremely low. The remaining risk is that the outcome of the project indicates that this approach proves to be unsatisfactory for the intended use of IESX in ODP. If this is the case, alternative means of achieving the goals of core-log-seismic integration will need to be found. We perceive this risk to be low.

IESX Budget

	FY 01
A. PERSONNEL	$5,920
B. FRINGE BENEFITS @ 25.7%	$1,521
TOTAL SALARIES AND FRINGE	**$7,441**
C. PERMANENT EQUIPMENT	**$4,000**
D. MATERIALS AND SUPPLIES	
Computer supplies and software	$1,000
General office supplies	$480
TOTAL MAT. AND SUPPLIES	**$1,480**
E. TRAVEL	$3,000
F. COMMUNICATIONS AND SHIPPING	
Communications	$800
Shipping	$300
TOTAL COMM. AND SHIPPING	**$1,100**
G. TOTAL OTHER COSTS	
Data Handling Services	$15,500
H. LDEO COMPUTER SERVICE	$3,000
IESX DIRECT COSTS TOTAL	**$35,521**
(MODIFIED DIRECT COSTS)	$28,521
J. LDEO INDIRECT COSTS @ 53%	$15,116
IESX BUDGET TOTAL	**$50,637**

To: Dr. Helmut Beiersdorf, EXCOM Chair (JOIDES Office)
From: Menchu Comas, ECOD EXCOM Delegate
Subject: **Brief Report on ECOD Member Status**
Date: 29 May 2000

This report intends to satisfy stipulations in Motion 99-1-4 of the JOIDES Executive Committee (January 1999), and attains the letter of the EXCOM chair (March, 2000) requesting ECOD status for membership requirements in Items 2 (a-c) of EXCOM Motion 98-2-8.

The ESF-European Consortium for Ocean Drilling (ECOD) is meeting these requirements as follows:

2 (a) -Contribution must be equal to or greater than 5/6 of full membership:

ECOD will contribute 99.1% of a full membership to ODP for 2000. This ensures that ECOD contribution for current year is greater of 5/6 (i.e., 5.946 /6).

2 (b) -They must make a firm commitment to work towards full membership:

ECOD makes a firm commitment to work towards full membership during ODP Phase III period. In fact, we have succeeded with our efforts to recruit Ireland to the Consortium. Ireland has now officially joined ECOD by signing an agreement with ESF concerning their membership, and a total of twelve countries now participate in ECOD. Furthermore, the status of ECOD country membership and individual country's effort towards increasing their quota, or to recruit new members, is a common point of debate at ECOD management meetings.

2 (c) -They must make significant progress towards achieving full membership each year:

By recruiting a new member, ECOD had made a significant progress towards achieving full membership. Their contribution was increased from 97.5 % to 99.1 % for year 2000. We can anticipate that ECOD will pay 99.5 % of a full membership for year 2001.

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20 February, 2000

Dr. H. Beiersdorf
EXCOM Chair

Dear Helmut,

EXCOM motions 98-2-8 and 99-1-4 require that the PacRim Consortium report to you annually on our membership status. Three events of the last year will likely be known to you:

1. The PacRim Consortium Board, at its May meeting in Vancouver, unanimously passed a motion directing the Secretariats in each PacRim country to seek additional funds from supporting agencies, in proportion to PacRim membership – if successful, this would have resulted in a return of the consortium to full membership;

2. The government of Taipei reduced in June its funding by 1/2, so that Taipei's share in PacRim dropped from 1/6 to 1/12;

3. The two Canadian funding agencies announced that between them, they will not be able to pay the entire currency exchange (to $US) required for a 1/3 share in PacRim, effective October, 2000. Efforts to change this decision throughout the summer months have so far been unsuccessful, but are still continuing (see below).

Both Korea and Australia have held firm to their existing commitment, but are unable to consider an increased membership contribution given the uncertainty in (mainly) the Canadian position. In summary, the scientists in all PacRim countries resolved in May to recommend steps to their funding agencies to achieve full membership. Such recommendations were made, but the governments of Taipei and Canada have instead reduced (or are anticipated to reduce) their funding. In Taipei, the chair of their ODP organization, Min-Pen Chen, resigned as a result. Prof. Kuo-Yen Wei was appointed as the new chair by the funding agency.

A considerable amount of time has been spent in Canada since mid-summer, 1999, investigating other funding opportunities. First, all avenues were pursued to convince funders to maintain at least the 1/3 membership contribution (including a letter-writing campaign to the national government by scientists and industry executives). Second, Dr. Shiri Srivastava of the PacRim Consortium office (in Canada until end 1999) initiated

discussions with India that might see India join PacRim at perhaps a 1/6 level – these discussions are still in progress. Third, preliminary overtures have been made to other national government agencies (notably Environment Canada) to find a source of funds to at least maintain Canada at a 1/3 membership contribution for the fiscal year starting October, 2000.

There are two end-member scenarios for October, 2000.

1. Canada might remain at a 1/3 membership level if another funding partner is found, and India might join PacRim as a 1/6 member. With Australia at 1/3, and Taipei and Korea each at 1/12, this would constitute a full membership for PacRim.

2. Canada might drop to a 1/4 share if NSF requires memberships to be in multiples of 1/12, and India might not join PacRim. This would leave PacRim as a 9/12 member, eligible only for Associate Member status according to EXCOM motion 98-2-8.

I cannot predict now what the PacRim funding situation will be in October. We are making concerted efforts to make the best of recent setbacks, and there is some possibility, though small, that PacRim could achieve full membership in late 2000. Our hearts are, I believe, in the right place, but funding continues to be tight across the consortium.

I trust this fulfills the EXCOM request for a report on PacRim membership status. I would be happy to provide details if required, and we will keep you informed of any developments in initiatives to increase funding, or to add an additional consortium member.

Sincerely,

Richard N. Hiscott
PacRim Consortium EXCOM representative

To: members, liaisons and observers of EXCOM, ODP Council, JOI Board of Governors and International Working Group for IODP.

From: Jim Briden

Re EXCOM and related meetings in Oxford, England – 25 to 28 June 2001

At the invitation of the UK Natural Environment Research Council, EXCOM will meet in Oxford on Monday and Tuesday 25, 26 June 2001. ODP Council and the JOI Board of Governors are expected to meet on Wednesday 27 June and provision is made for IWG to meet the following day, Thursday 28 June.
Action, please: will the organisers of each of these meetings please confirm to David Falvey that these are indeed the correct planning dates for each meeting

The venue will be St Anne's College, which provides pleasant surroundings for both accommodation and meetings. It is one of Oxford Universities newer colleges, located just north of the old University area, about 400m north of St Giles.

Accommodation will be in high quality student rooms, single or twin with *en suite* shower. The cost to delegates will be £50 per day single (£80 double) including all taxes, for room and full English breakfast. At current rates that is about $75 single and $150 double, and falling!

There will be an Icebreaker on the Sunday evening, and the Council dinner (hosted by JOI and NSF) on the Tuesday evening.

Subject always to the vagaries of English weather, this is an ideal time to visit Oxford, and members are encouraged to bring their partners and families. The College accommodation will be available at the conference rates both before and after the ODP meetings for those who wish to take further time to enjoy the culture and environment of the city and surrounding area. This facility may also be helpful for those who find cheaper air fares including stay over a Saturday night.

Action, please: In order to help the organisers gauge the call for twin-room accommodation and additional rooms for guests, attendees at the June 2000 meetings are asked to indicate (without commitment, of course)

1. whether they hope to bring guests to Oxford, and how many?
2. Whether a tour either of Oxford or of the Cotswolds on the Sunday is likely to be welcome?

I look forward to seeing you all again, on my home territory, next year.

Jim Briden
jim.briden@eci.ox.ac.uk